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SECTION OF OBSTETRICS AND GYNECOLOGY

Monday, June 5, 1933

PRESIDING:
Dr. Frank A. Pemberton, Boston, Chairman.
Dr. Joseph W. O'Connor, Worcester, Secretary.

CHAIRMAN PEMBERTON: Will the meeting please come to order. The only business before us is the election of officers. We will leave that until the last. The Nominating Committee consists of Doctors Lynch, Phaneuf, and Paine.

That Committee will report later.

The Bellevue Hospital in New York City was established in 1816, only five years after the Massachusetts General Hospital, which we of course look on as a very old one. It is one of the largest hospitals in the United States. It is a city hospital, and therefore it takes cases of all kinds and conditions. Because it is a city hospital it has to take, or it has to be a dumping ground for, neglected, and very sick patients, and as a result the number of patients suffering from venereal and puerperal sepsis is tremendous, and the staff has a rich experience in the treatment of such cases.

We are to be accorded the privilege this afternoon of listening to the Director of the Department of Gynecology, Dr. Frederick C. Holden, who will speak on "Pelvic Inflammation. Course and Treatment and Elliott Treatment."

PELVIC INFLAMMATION*

Course and Treatment and Elliott Treatment

BY FREDERICK C. HOLDEN, M.D.†

MR. *Chairman and Gentlemen*—I wish to express my appreciation and pleasure for the opportunity of being here this afternoon and I am especially grateful to Dr. Pemberton for asking me to talk on pelvic inflammation.

It has been my privilege to be in charge of the Department of Gynecology at Bellevue Hospital since 1919. The extent of the service can be judged by the fact that last year we had 2600 patients admitted to our wards, and 18,000 visits to our outpatient department. In addition, there are about 2400 patients admitted yearly to our obstetric service.

We have therefore had an excellent opportunity for observing all types of pelvic inflammation. Our experience is further enriched since we can keep our patients hospitalized so long as may be necessary, as this hospital is supported by the city, and patients are under no expense during their hospital stay. Our chief consideration therefore, is to send the patient home cured, and how long this takes is not of primary importance.

We shall present the subject to you by showing a series of slides, each one of an actual case illustrating some type of pelvic infection, and by telling you how we treated each type. We shall also discuss the Elliott treatment which we have been using since 1929.

Figure 1. *Acute Salpingitis* comprises 4% of our admissions. The most important part of our therapy is to maintain as great a degree of pelvic rest as possible. The patient is therefore kept flat in bed, not being allowed to sit up even in bed, so as to help keep the inflamed pelvic organs at rest. The head of the bed is elevated 4″ by means of blocks to facilitate drainage. Pain is relieved by icebag to the lower abdomen, and sedatives are given as required. We greatly stress the importance of careful bowel hygiene, avoiding both constipation and diarrhoea, as either distention or increased peristalsis will traumatize the inflamed adnexae.

We keep the bowels open by daily doses of mineral oil, one ounce, supplemented when necessary by milk of magnesia, one teaspoonful three times a day after meals, further supplemented by an enema at night if the bowels have not moved that day. Active catharsis is rigidly avoided in this type of case. We make infrequent vaginal examinations, and when done, this is charted on the temperature sheet, to see whether the examination caused a temperature rise.

We try to keep the patients in bed 10 to 14 days after the temperature is normal, and before discharge, try to eliminate any foci of infection which may lurk in the Skene's ducts,

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Bartholin's glands, or in the cervix. At discharge, these women are told in simple language the danger of reinfection, and are advised how to avoid future trouble. We advise their being in bed during the following three menstrual periods; interdict coitus for several months,

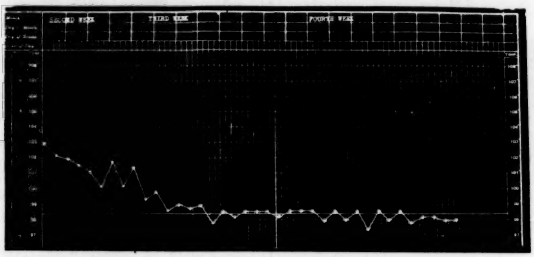


FIG. 1. M. C. Aged 21. Married seven months. Admission June 6, 1927. Discharge June 24, 1927.
Acute salpingitis cured with palliation. Gravida none. History of acute abdominal pain beginning on last day of her menses, 10 days prior to admission. Examination: Abdomen distended, tenderness in lower quadrants, introitus acutely inflamed, purulent discharge. Cervix red, tender on motion. Fundus anterior, exquisite tenderness in both fornices and in culdesac. Tender bilateral tubo-ovarian masses 4x6 cm. Treatment: Rest in bed, bowel hygiene, icebag, sedatives. On admission w. b. c. 16,000—84% polys, 10 days later, w. b. c. 12,200—78% polys, 16 days later, w. b. c. 9,200—76% polys. Examination on discharge showed pelvis to be absolutely normal.

and refer them to our outpatient department for any necessary after-care.

You may consider this very little treatment, but our results have been most gratifying, for in most cases we have been successful in avoiding operation. When you realize how young most of these women are, and that operation often results in crippling or total ablation of their generative organs, you must agree that it is important to avoid any operation, even though the conservative treatment herein outlined may in some cases take longer.

Figure 2, illustrates the harmful effect of drastic catharsis in acute pelvic inflammation. This woman's temperature gradually subsided with our treatment; she then became constipated and was given an active cathartic by an inexperienced junior interne. The resultant elevation of temperature, due to the traumatism by the overactive intestines, was more pronounced and lasted longer than the primary elevation of temperature. This is usually so. I do not know of any textbook in which the great importance of bowel hygiene is sufficiently stressed.

Figure 3 illustrates the harmful effect of persistent diarrhoea in acute salpingitis with immediate improvement as soon as the diarrhoea was controlled. This case had persistent temperature due to the damage done to the inflamed adnexae by a persistent diarrhoea, which had been overlooked. We stopped the diarrhoea by limiting the patient's diet to only boiled milk and barley water and giving Tr. Opii Deod. mm. X. every three hours as required. When the diarrhoea was controlled, she promptly improved and the temperature dropped to normal.

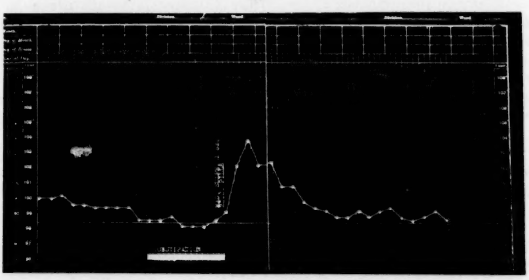


FIG. 2. F. R. Aged 25. Married seven years. Admission September 25, 1920. Discharge October 11, 1920.
Effect of drastic catharsis. Since curettage in April, 1920, patient has suffered with excessive bleeding, dysmenorrhea, profuse leucorrheal discharge, and pain in both lower quadrants of abdomen. Examination revealed chronic bilateral adnexal disease. Eight days after admission, following three days' constipation, patient was given 1 oz. of magnesium sulphate and 2 c.c. pills, and the following day the patient shot temperature of 103⅘°, felt acutely ill, with severe generalized abdominal pain. Blood count, 8,200 w. b. c.—79% polys on admission up to 10,400 w. b. c.—78% polys during period of temperature.

If I leave with you the one thought of the importance of maintaining careful bowel hygiene in pelvic inflammation, my object in coming to you will have been achieved. If patients, after discharge, do not continue to improve as much as you expect, it is usually because the

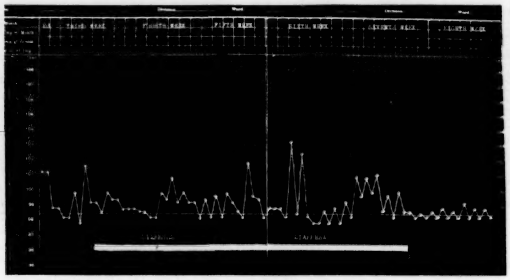


FIG. 3. H. B. Aged 23. Married 9 years. Admission September 26, 1922. Discharge November 19, 1922.
Diarrhoea in acute salpingitis with immediate improvement under rational bowel hygiene. Five days after onset of normal menstrual period, patient was seized with severe pain in lower abdomen and back, and the bleeding, which normally should have ceased, became profuse. Patient admitted to hospital. No improvement there due to a diarrhoea which was overlooked. As soon as the diarrhoea was controlled, there was immediate improvement.

rules laid down for them as to diet, pelvic rest, and bowel hygiene have been disregarded.

Figure 4. *Acute Salpingitis with Ascending Peritonitis.*

Abdominal drainage of peritoneal cavity.

Occasionally we see a case of acute salpingitis with peritonitis which continues to ascend despite our outlined palliative treatment. Such a woman is desperately ill, and if her abdominal condition shows no improvement after intensive treatment for 24 to 48 hours, laparotomy for drainage is performed, preferably under local anaesthesia. We have a considerable number of cases, which upon admission seem to have a general peritonitis complicating the salpingitis, but most of these improve when the distention is relieved by use of the Harris drip, Levin tube and pitressin. It is only the occasional case which requires laparotomy for drainage, and the greatest degree of judgment must be exercised, to be able to know which case does, and which case does not, require laparotomy. The inflamed pelvic organs should be disturbed as little as possible during the operation.

Figure 5. These two charts were brought down to us from two of the surgical divisions of Bellevue Hospital. Both were cases of acute salpingitis which were erroneously diagnosed as appendicitis, and laparotomy was therefore performed. In the first case, appendectomy, bilateral salpingectomy and unilateral oöphorectomy were performed and drains inserted. The chart shows a stormy postoperative course, and she was discharged five weeks after operation, still

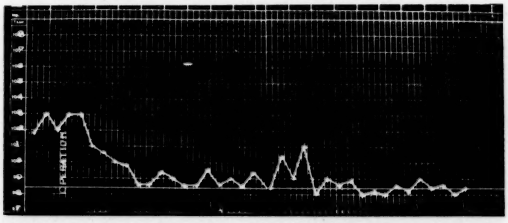


FIG. 4. *Acute salpingitis with peritonitis—drained.* B. H. Aged 41. Widow. Admitted May 5, 1928.
Chief complaint—pain in abdomen and vomiting. Patient married 12 years. Sterile. Three years ago left salpingo-oöphorectomy for a pain of seven years' duration. Menses have been regular. Last period—April 22, 1928. Present illness: Dull pain in L. L. Q. since last period, which became progressively worse until day of admission, when patient had chills, vomited several times, and had severe generalized abdominal pain. On admission: 22,000 w. b. c. with 92% polys.
Examination: Distended and marked rigid abdominal wall with marked tenderness. Cervix in axis, uterus small, anterior, fixed, culdesac and both adnexal regions filled with irregular, firm, moderately tender masses which bulged into culdesac and rectum. No fluctuation.
After 18 hours' observation, symptoms of peritonitis increasing, patient had laparotomy. Findings: acute peritonitis, about one quart of purulent fluid was evacuated. Pelvis seat of acute inflammatory process. Two cigarette drains placed in pelvis. Patient given intensive nursing, fluids forced by mouth, rectum and skin. Distention combated. Drains out fourth day postoperative. Wound well healed by primary union. Uneventful recovery.

draining. In the second case, when the surgeon found he had a case of acute salpingitis with pus exuding from the tubes, he closed the abdomen without any further manipulation, no drains were inserted, and the chart shows her prompt recovery.

These two charts graphically illustrate the correct procedure to be carried out when we open an abdomen expecting to find an acute appendix, and instead, find acutely inflamed tubes exuding pus. The management of acute salpingitis and acute appendicitis is not the same. There are still too many tubes and ovaries needlessly removed by operating on them in the acute stage. Let me again repeat, when a case of acute salpingitis is mistakenly operated on, do not add to the damage by destructive surgery. Close the abdomen and carry out the conservative treatment herein outlined.

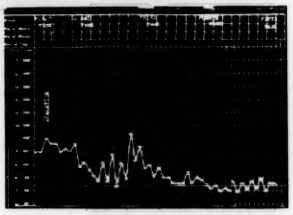


FIG. 5. L. C. Aged 23. Married 2 years. Admission December 9, 1927. Discharge January 3, 1928.

Acute salpingitis operated for appendicitis. Normal delivery 21 months ago and an induced abortion 6 months ago. Admission to surgical ward with history of pain in R. L. Q. of 3 weeks' duration and vomiting of 4 days' duration. Marked tenderness and rigidity of R. L. Q. Immediate laparotomy advised for possible retrocecal appendix with abscess formation. Findings: Normal appendix and gall bladder, both tubes acutely inflamed with pus oozing from fimbria and right ovary involved in right tubo-ovarian mass 8 cm. in diameter. Operative procedure: Appendix, both tubes and right ovary removed, 2 cigarette drains placed in pelvis. Postoperative course stormy, abdominal sinus present and discharging 23 days postoperative. Pelvic examination showed normal-sized uterus, fixed with moderate parametritis, extending from culdesac into both fornices.

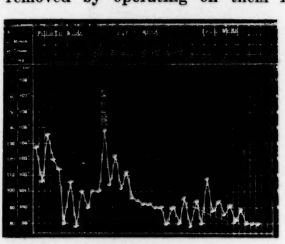
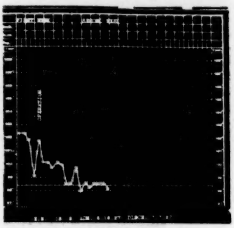


FIG. 6. D. P. Aged 22. Married 4 years. Admission October 16, 1927. Discharge November 4, 1927.

Pelvic Abscess: History of rape when five years old, leucorrhea ever since. Grav. 1, para 1, 3 years ago. Stormy puerperium with fever and pain, in bed 4 weeks. On ward 1 year ago with acute exacerbation of chronic salpingitis, palliative treatment for 3 weeks. Present illness: On third day of regular menstrual period, patient had severe pain in lower abdomen with temperature. In bed since. On admission fundus was fixed, tender, bilateral masses in fornices. Five days later right mass had increased in size, extended into culdesac, fluctuant. Colpotomy, 16 ounces of pus obtained. Three iodoform gauze wicks inserted. Improved steadily. Home 12 days later. Blood counts from 18,000 down to 11,000 w. b. c. and from 88% to 79% polys.

Figure 6. *Pelvic Abscess.* A pelvic abscess may subside due to absorption of the exudate, or the abscess may rupture into the rectum, vagina, bladder, or into the peritoneal cavity. In the event of the last happening, "puff, like a candle, and out she goes." We therefore examine these patients about once a week to determine whether a pelvic abscess is forming, and to ascertain the time for colpotomy. It may point in the culdesac or at one side of the pelvis. When performing a colpotomy, it is important to make the opening sufficiently wide, and keep it open long enough to afford adequate drainage, otherwise the colpotomy opening will close too soon, and the illness will be unduly prolonged. This case shown had a colpotomy performed and the patient went home thirteen days later. Occasionally such an abscess may point above Poupart's ligament, and is then drained extraperitoneally.



H. M. Aged 18. Single. Admission June 16, 1927. Discharge July 7, 1927. Acute salpingitis opened as appendicitis—closed with no manipulation. Complained of generalized abdominal pain which localized in right lower quadrant. Observed for 24 hours, opened because of general peritonitis. Appendix normal. Both tubes acutely inflamed, 5 cm. in diameter, extensive pelvic peritonitis. No free blood or pus. Abdomen closed, pelvic tissues not manipulated. No drainage. Blood counts, preoperative, 12,100 w. b. c. with 81% polys, postoperative, 20,000 w. b. c. with 86% polys.

Figure 7. *Recurrent Salpingitis.* Conservative operation. This is an interesting chart of a nineteen year old girl of the streets. The first time she came in, she had acute salpingitis which subsided with palliative treatment. She could not or would not follow the rules we had given to her on discharge. She came in subsequently with the same condition, which again subsided, and upon discharge, she was again given careful instructions on how to live. She came in a third time, again with an acute exacerbation. We then decided to operate, after following the regulation laid down by Frank Simpson years ago; that when operating on such cases, it is preferably done after they have had a normal temperature and normal leucocyte count for at least three weeks, with no elevation of either after a vigorous bimanual examination. At operation, inflamed tubes and ovaries were found adherent in the culdesac, posterior to a retroverted uterus, and chronic inflammation of the appendix. The appendix was removed, the ad-

hesions were freed, a Webster-Baldy suspension of the uterus, and bilateral Poole's suspension of the ovaries were done. She made an excellent convalescence, and remained symptom-free. Two years later she became pregnant, and waited four months before she had an abortion performed, without any morbidity subsequently.

Figure 8. *Postabortal Sepsis.* This is a

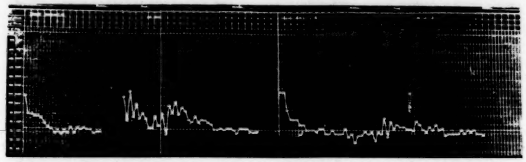


FIG. 7. A. S. Aged 19. Single. Admission October 12, 1927. Discharge October 23, 1927.

Recurrent salpingitis — conservative operation normal labor and puerperium 16 months ago, menstruation normal. Entered with severe abdominal pain radiating to back (after beginning of period). Tender bilateral adnexal masses, acutely inflamed cervix, smear negative. Two blood counts, averaging 10,000 w. b. c.—85% polys. Sed. 19". Discharged after 9 days' flat temperature, symptom-free, second admission 16 days later. Recurrence of severe abdominal pain after beginning of period, tender bilateral, adnexal masses, moderately eroded cervix. Blood count 8,600 w. b. c.— 78% polys, sed. 11.15—34". Sed. 11.23—34". Discharged improved after 13 days' normal temperature, symptom-free. Third admission 18 days later. Marked pain in both lower quadrants of abdomen, and backache. Attack followed close upon next menstrual period. Tender bilateral tubo-ovarian masses 8 cm. in diameter. After 20 days of palliation (sed. 151") patient operated on. Findings: Uterus normal, both tubes chronically inflamed, tortuous, edematous. Both ovaries normal, adnexa prolapsed and adherent in culdesac. Baldy-Webster suspension, Poole's suspension of left ovary, appendectomy. Postoperative course very smooth. Discharged January 17, 1928, symptom-free, both adnexae palpable, neither enlarged nor tender. Patient has had subsequently normal periods, without pain.

woman who entered three days following the insertion into the uterus, of a slippery elm stick to induce an abortion.

This seems to be a popular method among our poor and ignorant population, and too often is the cause of desperate sepsis. Regardless of how critically ill these patients may be, we always take the attitude that they will get well, and bend all our energies to active treatment. The most important therapeutic measure is to give such a patient the exclusive services of a competent day and night nurse. The supportive treatment is most important, and cannot be carried out except with intensive nursing. Attention to intestinal hygiene is most important. Distention, diarrhoea and vomiting must be guarded against or quickly controlled, and proper bowel elimination maintained. Blood transfusions are a very important aid to combat both anaemia and sepsis. We prefer small transfusions of about 250 to 300 cc. repeated every second or third day. If necessary, we give glucose intravenously in the interim. Each case is treated individually and symptomatically, laying our greatest stress on intensive and competent nursing care.

Figure 9. *Septicemia, Streptococcus Hemolyticus.* Postabortal. Here again is a desperately sick patient due to a self-induced abortion by inserting a slippery elm stick. This patient had positive blood cultures on repeated examinations. We treated this patient just as the preceding one, laying greater stress on repeated

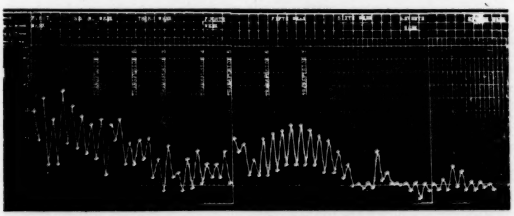


FIG. 8. G. H. Aged 23. Married five years. Admission January 23, 1926. Discharge March 18, 1926.

Postabortal sepsis. Three days before admission inserted slippery elm stick to terminate six weeks' pregnancy. Stick removed next morning. In bed with chills and fever since. Moderate bleeding. Patient admitted acutely ill. Fundus slightly enlarged. No other palpable pathology. From tenth to twenty-fifth day of illness desperately ill with marked abdominal distention, persistent vomiting, and diarrhoea, extremely resistant to treatment and controlled with greatest difficulty. When distention subsided, an inflammatory mass was felt in L. L. Q. which extended half way to umbilicus. From twenty-fifth day improvement began, mass became gradually smaller until it disappeared. Discharged cured 54 days after admission. Pelvic examination negative. Blood counts ranged from 26,000 w. b. c. with 92% polys on admission down to 10,000 w. b. c. Seven blood transfusions, intensive nursing, especially for distention, vomiting and diarrhoea.

blood transfusions. In this group, we usually withdraw 250 cc. of the patient's blood before injecting 500 cc. of the donor's blood. This patient had 13 blood transfusions, and left the hospital a well woman, 104 days after admission. We have not yet accepted Dr. Baldwin's procedure of immediate hysterectomy in these desperately sick septics. We have seen so many

cases of this type recover under this method of treatment, and leave the hospital not only alive, but well and physiologically intact.

Figure 10. *Pelvic Thrombophlebitis.* I first saw this patient three weeks postpartum. We thought she had pelvic thrombophlebitis, because at no time during her illness could we palpate any pelvic pathology. Yet she was desperately ill, and at times had a temperature range of 12 degrees a day, from 95 to 107. She was seen by a large number of consultants and most of them believed she could not get well. There are only two ways of verifying a diagnosis of pelvic thrombophlebitis—at operation or at autopsy. We do not believe in operating for such a condition. She had wonderful nursing care, repeated transfusions, and since it was during the summer time, she was kept on an open sunny balcony. Subsequently she became pregnant, had a normal delivery followed by an uneventful puerperium.

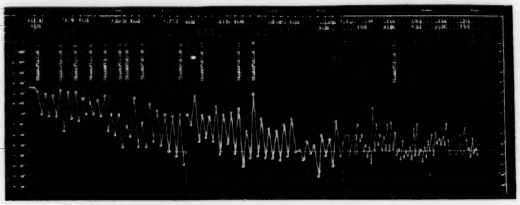


FIG. 9. Septicemia—Postabortal. P. S. Aged 22. Married two years. Admission December 23, 1926. Discharge March 25, 1927.

Apparently moribund when admitted, with generalized peritonitis, marked distention and vomiting. History of a self-induced abortion of a 10 weeks' gestation by means of a slippery elm stick 10 days prior. On eighteenth day mass palpable in lower abdomen extending up to within two fingers of umbilicus. On twenty-sixth day fluid in left chest, chest tapped. On seventy-second day, induration in culdesac and left fornix. On ninety-seventh day patient up. Discharged after 104 days of illness. Slight induration and thickening in both adnexae. Daily complete blood counts, the first month averaging 20,000 w. b. c. with 88% polys—4,750,000 r. b. c. with 80% hemoglobin, second month averaging 17,500 w. b. c. with 80% polys—3,800,000 r. b. c. with 75% hemoglobin, third month averaging 10,000 w. b. c. with 78% polys—4,300,000 r. b. c. with 80% hemoglobin. Blood cultures: The first two positive for streptococcus hemolyticus. Treatment: Thirteen blood transfusions in which 2-300 cc. of blood was withdrawn and 6-800 cc. given. Intensive nursing, careful bowel hygiene, stay in hospital 96 days.

Figure 11. *Frozen Pelvis.* Somebody coined the phrase "frozen pelvis". This is an illustration of such a case. This was a little Porto Rican girl who had a difficult instrumental delivery of a full-time child, following which she ran this course as shown. She had a "frozen pelvis" (fig. 12), that is, there was a solid mass of induration which filled all the fornices extending to the umbilicus, masking all the pelvic organs, as if plaster of paris had been poured into the pelvis. Twenty-three weeks later, there was sufficient softening of the exudate to permit posterior colpotomy with evacuation of a large amount of pus. Throughout her stay she was given intensive supportive, and careful symptomatic treatment. The colpotomy relieved her of a large part of the infection, but it was nature and time that gradually absorbed that tremendous amount of inflammatory exudate into the parametrial tissues so that slowly but steadily it melted away, until on discharge no pathology was palpable. This patient subsequently had two more full term pregnancies, the first of which ended in a difficult version and extraction, resulting in a dead baby, the second was terminated by an elective classical cesarean section, with a normal puerperium after each one.

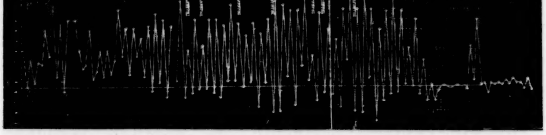


FIG. 10. B. P. Aged 21. Married one year. Admission January 30, 1922. Discharge May 13, 1922.

Pelvic Thrombophlebitis. Delivered by physicians at home of a full term baby, three weeks prior to admission. Confined to bed since with chills and fever. Throughout stay in hospital no abdominal or pelvic pathology palpable. Patient relatively comfortable throughout with only occasional delirium. Blood cultures taken repeatedly — all sterile. Thirty-four complete blood counts were done with relative leucopenia averaging from 3-5,000 w. b. c. with 68-83% polys. Treatment: Seven blood transfusions, 240 cc. leukocytic extract. Intensive nursing and careful bowel hygiene. Discharged 124 days postpartum, cured. Subsequently had a normal labor and puerperium.

Figure 13. *Turpentine Injection of Tubo-Ovarian Abscess.* It was at the suggestion of Herbert Little of Montreal that we adopted this procedure for selected cases. We use it only in

young women who have tubo-ovarian abscesses which do not yield to palliative measures, and in whom the pathology present is too extensive to allow conservative surgery to be done. Through the abdominal incision we expose the tubo-ovarian mass, only enough to allow a large

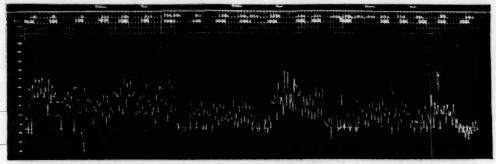


FIG. 11. F. T. Aged 22. Married five years. Admission February 25, 1925. Discharge September 23, 1925.
Frozen Pelvis. One day following very difficult mid forceps delivery of a 2580 Gm. child (which died soon after) patient had a temperature of 103°, abdominal pain, fever and chills, within next three weeks developed parametrial masses involving perivaginal, rectovaginal, perirectal areas with a sinus communicating into vagina through which there was profuse drainage of pus. Patient desperately sick most of the time with increasing pelvic pathology, ultimate formation of large pelvic abscess. Colpotomy 168 days postpartum. Discharged 210 days postpartum with no gynecological pathology other than a retracted dimple on the posterior vaginal wall. Twenty-eight blood counts ranging from 27,000 w. b. c. 96% polys—7,500 w. b. c., 75% polys. Treatment I: Transfusion, 8 milk injections. On balcony throughout spring and summer with no effect on temperature until colpotomy was done. Readmitted in labor one year later. At that time version, extraction and craniotomy because of extension of after-coming head, was done. Ran uneventful puerperium, symptomless and flat temperature throughout. Readmitted January 1928, full term elective caesarean section done, uneventful recovery.

needle to be inserted therein. We aspirate as much of the pus as we can, and without removing the needle, inject half that amount of a solution of ten per cent turpentine in sterile mineral oil. Before removing the needle we put a figure of eight suture around the opening, using fine catgut. These patients have a smooth convalescence, and although small masses remain in the adnexal regions, the patients are left symptom-free. Both Brewster, who first adopted this procedure, and Little have reported subsequent pregnancies in some of these cases.

Elliott Treatment. I am going to talk to you for a few minutes about the Elliott treatment.

Figure 14 shows the Elliott bag in place.

In November, 1929, the Elliott treatment first came to my attention. At that time it was a crude affair. The machine as we have it today is an ingenious apparatus. It has a universal motor which runs on either direct or alternating current, and the distention of the bag and the temperature of the water in the bag are both easily controlled.

At first we treated all types of cases, acute and chronic, to see what it would do. Some of the observations are these: We had blood counts done on 250 cases just before and after a treatment, and we found that in about 90 per cent of these cases we had a leucocyte increase of 17½ per cent. In some cases of pelvic cellulitis that were expected to eventuate in pelvic abscess, the exudate was absorbed. We used it in cases that had been drained through the culdesac, to hasten the resolution of the exudate. We have also found it a most effective measure of treating inflammations of the bladder.

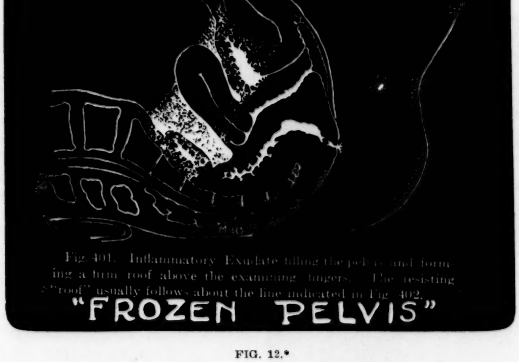


FIG. 12.*

*Figure 402 referred to in the legend on this plate was not submitted for publication.

We have used it on desperately sick cases of acute salpingitis with pelvic peritonitis, and at no time have we had any untoward results. Gurnee, who collaborated in a paper on the Elliott treatment read in April, 1931, is now treating gonorrhoea in women, using this procedure alone. We feel sure, if the Elliott treatment is used properly, we can cure gonorrhoea of the cervix in 30 daily treatments. It seems a rather broad statement, but that has been our experience with this treatment.

The Elliott treatment is not foolproof. It requires a considerable degree of intelligence and some experience to use it properly and get the results outlined. More than 15,000 treatments have already been given on our service, and one room at Bellevue Hospital with the full-time services of a nurse well trained in its use have been given over entirely to this treatment. It is a treatment preferably to be given at home or in the hospital, not ambulatory. To quote from the article written about this treatment, our conclusions at that time were as follows:

"By means of the Elliott apparatus a consistently uniform temperature of 130° can be maintained for any length of time against a large area of distended vagina, cervix, adjacent parametrium, and pelvic organs. This application of heat causes a marked increase in pelvic circulation. In our experience, it is an excellent treatment for gonorrhoea because a temperature lethal to the gonococci can be easily maintained for an indefinite period of time, thereby clearing up the latent foci of infection which heretofore were so difficult to reach.

"In cases of salpingitis, pelvic cellulitis, tubo-ovarian, or pelvic abscess, the marked increase in pelvic circulation causes a more rapid resolution in a shorter period of time than with any of our previous methods of treatment."

More recently, we have found this procedure very beneficial in the treatment of postoperative shock. Using moderate distention, with a temperature of 115.°-120.° for a period of an hour at a time, the results have been most gratifying.

I want to again express my pleasure at the privilege of being here this afternoon.

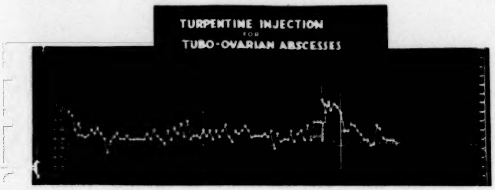


FIG. 13. A. T. Aged 22 years. Laundry worker. Admission April 28, 1930. C. C.: Pain in lower abdomen, vaginal bleeding. Family history: Negative. Past History: Typhoid fever 1919. Menstrual History: Onset at 11 years every twenty-five days for five days without pain. Last regular period March 28, 1930. Married nine years, grav. 1, para 1, 8 years ago, normal delivery and puerperium. Sterile since.

Present illness: March 28, 1930, with onset of expected period, had severe pains in lower abdomen and L. L. Q. which have continued to date. Her period lasted for 10 days, with profuse flow with continual spotting since. She was confined to bed since onset. Abdominal and vaginal examination showed a tender mass extending half way to umbilicus, arising from tender masses which filled both fornices and culdesac, obliterating the outline of the uterus. W. B. C. 7-8,000, sedimentation time 20 minutes.

For the next five weeks she was in bed with conservative treatment. The masses remained the same size, but pain and tenderness were greatly decreased and the sedimentation time increased to 50 minutes. Operation: Aspiration of bilateral tubo-ovarian abscesses (210 cc. on left side and 115 cc. on right side) and almost an equal quantity of ten per cent turpentine solution in sterile mineral oil was injected.

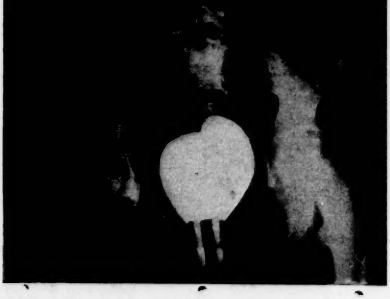


FIG. 14. The Elliott Treatment. Vaginal Applicator in place.

DISCUSSION

CHAIRMAN PEMBERTON: This paper will be discussed first by Dr. A. K. Paine, of Boston.

DR. A. K. PAINE, Boston: *Mr. Chairman*—I am very glad of this opportunity to express my appreciation of Doctor Holden's paper. The section is to be congratulated on being able to hear such an instructive talk on the management of pelvic inflammation.

It seems to me that the most important lesson Doctor Holden teaches us is that abdominal surgery should play a very small part in the management of acute pelvic inflammations. I was greatly interested to hear him emphasize the importance of infrequent vaginal examinations during the acute stage of the inflammation. I had begun to arrive at

a similar conclusion, but his emphasis on bowel hygiene is an entirely new idea to me. It would seem to be a very important contribution to the management of these cases.

I was glad to hear him emphasize the value of transfusion in the treatment of puerperal septicemia. It has seemed to me for some time that it represents one thing that we have which may hold some promise of success in a given case. He stressed the importance of adequate nursing always so important in these cases.

One or two points occur to me. First, in regard to these recurrent inflammations, the repeated attacks of salpingitis and all that goes with it; our experience at the Medical Center Clinic, where during the last fifteen years we have treated some 5,000 of these cases, has demonstrated, to our satisfaction at least, that these recurrent attacks represent practically always uncured gonorrhea. The eradication of the causative organism is a first essential if the recurrent attacks are to be prevented or minimized.

Another thing which we have found to be of value in these series of cases is pelvic drainage for the case with persisting acute symptoms. We have it as a working rule, if temperature and pain, especially temperature, persist in a given case longer than ten days, that case is to be drained through the posterior culdesac. This is done irrespective of what one may find on bimanual examination. We do not wait for the formation of a massive abscess to put drainage into effect. We drain the pelvis if acute symptoms persist for more than ten days. I have an idea that we may use it in the type of case Doctor Holden describes, the one in which he gets an impression that the condition will not improve with conservative treatment. My own inclination in such a case would be to drain vaginally, and not to do a laparotomy. The important thing about pelvic drainage, when it is employed, is that the drain, gauze, should be left in situ for eight or ten days. One is sure then of establishing a sufficiently permanent drainage. Incidentally, in this connection, to bear out Doctor Holden's testimony that "Nature is grand," we have seen a number of successful pregnancies occur subsequent to this pelvic drainage. It seems to us a most conservative procedure in cases where surgery is really necessary.

I am convinced that abdominal surgery in these pelvic inflammations should be practically limited to the late cases, what we call the "third stage" of pelvic inflammation. This stage is of course in its essential pathology one of degeneration, subsequent to the prolonged inflammatory process.

I have had no opportunity to use the Elliott apparatus. Surely the results Doctor Holden describes are most significant and worthy of our serious consideration.

CHAIRMAN PEMBERTON: The discussion will be continued by Dr. J. T. Williams of Boston.

DR. WILLIAMS: *Mr. Chairman, and Ladies and Gentlemen of the Society*—I suppose that I was selected to discuss Doctor Holden's paper because at the Boston City Hospital we have a large number of cases of pelvic inflammation. Not only do we have a large number, but we have a particularly malignant type of pelvic inflammation. Such patients seem to exist in every city, and in every city they seem to go to one particular clinic. In Boston we have them at the City Hospital, in Philadelphia they go to the Philadelphia General, and in New York apparently they go to Doctor Holden at the Bellevue.

Doctor Holden has obtained good results with the Elliott machine. At the City Hospital we had two Elliott machines on trial over a period of several months in 1931 under the immediate supervision of Dr. Benedict Boland. Doctor Boland gave a great deal of time and effort to a personal supervision of this treatment, and I checked the clinical results. Our combined opinions agreed in the following conclusions:

The Elliott machine has great value in the treatment of the mild and moderately severe types of acute gonorrheal pelvic inflammation.

It does not, however, improve greatly the results achieved by proper technique in giving long hot vaginal douches.

It requires closer supervision than the use of the prolonged hot vaginal douche, and it is doubtful whether the saving in time of hospitalization of the patient outweighs the expense of the technician's or supervisor's time in applying the treatment. I should like to emphasize all that Doctor Holden has said to the effect that this is not a thing to be turned over to any probationary nurse. It requires very skilful use, and it needs somebody who knows just what he or she is doing or there is likely to be trouble.

In puerperal septic infections it was found to be of doubtful value, and in two cases the treatment seemed to aggravate the condition, resulting in the formation of pelvic abscesses which required drainage.

While we are on that subject I would say I have also had quite a large experience with these puerperal septic cases, especially the slippery-elm stick type of which Doctor Holden has spoken. We have come to the conclusion that practically all operative measures, except the drainage of a pelvic abscess, are absolutely harmful. The only way we can attack them is by raising the patient's resistance, by good nursing care, by nourishment, and by the use of repeated transfusions. I should agree absolutely with Doctor Holden on that point.

Doctor Paine has spoken of drainage of the posterior culdesac in acute pelvic inflammations, followed later if necessary by a general cleaning out of the pelvis. We have tried this procedure in patients who have not quieted down under expectant treatment but have found that nearly all have returned demanding that something radical be done.

The economic pressure on our patients is tremendous. They must be returned to their work or their household duties in the shortest possible time. After a considerable experience we have adopted the following routine for patients with acute pelvic inflammation:

Rest in bed, ice to abdomen, alternating with hot vaginal douches, catharsis, and forced fluids.

In the moderately severe case the temperature falls to normal in seven to fourteen days. In the severer cases it may remain elevated three to six weeks or even longer. The white count is taken and the sedimentation time by Friedländer's method is estimated frequently. I wish to emphasize here the importance of that sedimentation test, because if you find a normal white count but a quick sedimentation time, let your patient alone, wait a little longer before you operate, and you will not have trouble.

When the temperature has remained normal for at least one week, or better two, if the white count is normal and the sedimentation time is one hour plus and there is no abdominal or vaginal tenderness, the patient is examined for disposition. If the pelvis is clear she is discharged, but if there are definite tubo-ovarian masses it can be foretold with certainty that exacerbations of the acute pelvic inflammation may be expected, and the patient is booked for a radical abdominal operation while she is in good condition for it.

In the five years 1927 to 1931, inclusive, which are

the first five years in our new building, we have treated 1,493 cases of pelvic inflammation, of which 631 or 42 per cent were operated on abdominally, with a mortality of 2.8 per cent.

I have been greatly interested in Doctor Holden's paper, which has covered the subject very thoroughly, and I have also been interested in Doctor Paine's ideas as given in his discussion; but my faith is still unshaken in the routine which I have outlined above as carried out at the Boston City Hospital.

CHAIRMAN PEMBERTON: The paper is now open for general discussion.

DR. BENEDICT F. BOLAND, Boston: *Mr. Chairman*—I think we are all interested in Doctor Holden's remarks this afternoon, as he has portrayed many conditions the treatment of which is very essential in gynecological work. I shall more or less confine my remarks to the Elliott treatment, this machine having been assigned to me several years ago, when it was tried out in the Boston City Hospital. At that time, a representative of this company came to Boston and desired to obtain more data in regard to the workings of this apparatus. Having done some cultural work on the gonococcus years previously we decided to do the same experiments with the Elliott machine, with our work more in detail relative to the cultural growths and what happens following them.

The theory of this machine is one of heat. It is interesting to note that 50 years ago the heat irrigation method was first brought out by Clark of New York. He claimed 180 degrees heat by this method of irrigation.

Three years ago in New York, Hyams demonstrated another hot water irrigation method which was controlled by a thermostat on the inlet and outlet. His method involved putting an instrument into the vagina which made it water-tight. This apparatus had an opening for the insertion of a baby cystoscope and another for the insertion of the instrument through which the water flowed, on the tip of which was a small ureteral catheter to be inserted into the cervix. As all vaginal openings are not of the same contour as the result of tears and trauma, seepage of the hot water would emanate around the instrument, and the patient therefore was apt to suffer discomfort. I have seen it function and I discarded it because it could be used only up to 118 degrees of moist heat.

Another heat method used was hot air blown into the vagina by means of a fan. A dry heat method was the use of a dryer such as a barber uses for your hair after a shampoo.

In 1925, Corbett and O'Conor used diathermy in the treatment of pelvic inflammation. At that time the staff decided to look into this method and this was my first experimentation with this line of work. We studied a series of cases both of Neisser infections and pelvic inflammation with the treatment of diathermy. These patients had blood cultures, smears and white counts done before and after treatment, and cultures of the cervix before diathermy was applied and following the diathermic application. The same routine was laid down in the Elliott treatment. Our diathermic results showed that diathermy could be used from a physiological viewpoint only up to 115 degrees at most. Over 115 degrees we obtained coagulation of the cervix and had to stop treatments. Diathermy did not absolutely kill the gonococcus, although after a period of time it did promote or produce discharge following its application. We found that douches, immediately following this treatment, tended to cut down both the discharge and frequency of positive cultures.

Then the Elliott machine came into use at the hospital. Now I fully agree with Doctor Holden that this is a hospital treatment and not indicated as an office procedure. I think it should be handled under expert supervision. Cases to be treated by this machine should be under the care of a man that knows the different varieties of pelvic inflammation.

In the course of this work every patient was first examined by Doctor Williams. Following that examination I examined the case. We both made separate notes, neither of us being expected to show the other his observations. The patients were all house cases. They were put through this method and given the Elliott treatment. Each case was examined weekly by Doctor Williams and me to note the progress, if any, in the treatment. The temperature was run, as Doctor Holden says, very nearly up to 130 degrees.

One thing that Doctor Holden did not say about the machine was that this treatment does make the cervix and vagina almost like tissue paper, and by insertion of a speculum following treatment one can abrade the vagina. Care is essential both in examination and instrumentation following treatment.

From the laboratory viewpoint we studied these cases by cultures and smears before and after treatment. Following the application one would obtain an almost pure, thin discharge. The two cases that Doctor Williams spoke about which were operated, were both cases of frozen pelvices which had streptococcus hemolyticus infections following deliveries.

Sedimentation time was taken on every patient before treatment, as was a white count. These two tests were carried out weekly while the patient was under treatment. More value was placed in the sedimentation time than the white count for, when the sedimentation time remained stationary, it was a fairly good indication that the case would not respond to treatment by this method. In those cases in which the sedimentation time dropped and the white count became elevated, results were obtained.

Both of these streptococcus hemolyticus cases developed inguinal glands, which broke down and had to be excised. The result of this type of treatment was poor. In the series of cases which were of a gonorrheal nature I agree with Doctor Holden in his conclusion, in view of the fact that at the end of about 24 days these cases were free from gonorrheal infection, that is both by smear and cultural methods.

We did not place much faith in the complement fixation test because it is variable.

We took the white count on these patients both before and after treatment. The white count will elevate, very possibly, from 200 to 2000 or more. We also took the temperature before and after treatment. Sometimes these patients would elevate their temperature anywhere from one to two degrees, and the only difficulty we found was that when the temperature became elevated, the patient became groggy, and was not fit to be an ambulatory type of patient. I have enjoyed hearing Doctor Holden's paper which was complete and well illustrated.

CHAIRMAN PEMBERTON: Is there any further discussion?

DR. ERNEST V. CALL, of Lewiston, Me.: *Mr. Chairman*—I am very much interested in this line of work, and I am pleased to see the conservatism expressed in quick operations in these cases. I believe many of them come to operation too soon. That has been done in the past.

I had an opportunity to see something about heat

treatment this winter. I am very much interested in this apparatus, but I feel that the difficulty in its general use, unless it is done carefully, is much like the Murphy drop treatment which is not so good unless watched carefully as the normal salt injection by the rectum given at intervals.

This winter I had an opportunity to visit four of the largest clinics in Europe. I found that where we use ice for every inflammatory process, they use heat. I was there 7 weeks for the most part visiting the gynecological clinics, in which I am much interested, and I saw only one pus tube removed during that time. The clinics in Vienna and Berlin were the largest, with lots of this kind of work. I am convinced that this heat is good. When we want to stop a hemorrhage we apply ice to stop the flow of blood and when we have an inflammatory process there is a rush of blood there by nature's method. The heat increases the supply of blood also and that is what we need to help carry away the inflammatory process.

In appendicitis you know their mortality is about nine per cent, while ours is around 25 or 30. In some hospitals, if a case of acute appendicitis comes in, if there is no general peritonitis, and no localized condition, they operate. If there is a localized abscess of the appendix, or some peritonitis they put the patient to bed with hot water applied over the abdomen and wait for the storm to blow over, but are ready to operate at once if bad symptoms develop.

There is certainly much for us to think about in regard to heat and the value of it. I am using it now, and think there is great value in it, if we would use it more often.

CHAIRMAN PEMBERTON: Is there any further discussion? If not, will you please close, Doctor Holden?

DOCTOR HOLDEN: *Mr. Chairman*—With reference to Doctor Paine's remarks about pelvic drainage, I wish to say that 40 years ago we had in New York a surgeon by the name of Pryor, who was at that time one of the foremost advocates of early incision and drainage of the culdesac even before fluctuation. This is not our present method of treatment. The Elliott treatment is well suited to cases of pelvic cellulitis. We have found it satisfactory in cases we thought would surely eventuate in pelvic abscess. By the use of the Elliott treatment, the exudate was absorbed in many of these cases, or if an abscess did form, it formed more quickly and we were able to drain it sooner, thereby shortening the period of illness. The temperature of a vaginal douche cannot exceed 115° without burning the perineum, which is more sensitive to heat than the vagina.

The apparatus of Hyams is decidedly more complicated than that of Elliott, and the same degree of temperature and distention cannot be so uniformly maintained.

I am interested in what Doctor Call says, because he and I are both real Downeasters. I wish you would seriously consider the Elliott treatment. It came to us at Bellevue Hospital, about four years ago and the longer we use it, the more we feel it has a wide field of usefulness if, when properly employed, there is sufficiently careful attention to the details of its application, which is essential to success.

CHAIRMAN PEMBERTON: I am sure I am correct in expressing our appreciation to Doctor Holden for coming here from New York on this hot day to give us this very interesting talk.

The next paper is on one of the obstetrical emergencies which I know nothing about, so I will leave it to Dr. Foster S. Kellogg, of Boston, to talk to you on Placenta Previa.

PLACENTA PREVIA*

A Review of 437 Cases From The Boston Lying-In Hospital

BY FOSTER S. KELLOGG, M.D.†

THE best treatment for patients with placenta previa is not yet certain. Many factors, environment of patient and doctor, training of doctor, history and condition of patient, age and viability of baby, parity, condition of the cervix, type of previa, and amount of bleeding enter into the question to make decision difficult. Individual experience too, is limited, and dogmatism based on small series of cases is not convincing. Compiled statistics are difficult of constructive interpretation because of omission of detailed data. These facts must be borne in mind critically, in what follows.

Whatever differences of opinion exist as to the best treatment of placenta previa, all obstetricians of experience are in accord that certain procedures are absolutely dangerous to these patients. These procedures may be called "don'ts" in the handling of placenta previa.

We have ample evidence from the records of our early and middle periods that we violated these rules and that this in part accounted for our high mortality in those years. We have ample evidence in our last series also that, in spite of constant preaching to the contrary, these "don'ts" are still being disregarded to some extent by physicians outside the hospital to the detriment of patients. Because of their absolute importance, they are repeated here.

Do not divulse the cervix to any degree. Delivery from below is undertaken only on the principle that the cervix dilates itself slowly by bag or breech with normal uterine contractions. Just enough gentle pressure should be made with weight on the bag or traction on the leg to control bleeding.

Do not temporize with a bleeding case at home. Send her immediately to the hospital on the first bleeding. It is probably true that maternal mortality increases with each subsequent hemorrhage. So too, does the fetal mortality.

Do not examine a bleeding patient vaginally

*From the Department of Obstetrics, Harvard Medical School. Read before the Section of Obstetrics and Gynecology at the Annual Meeting of the Massachusetts Medical Society, Boston, June 6, 1933.

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until prepared to take the first steps in delivery. She may bleed to death before anything can be done to stop the bleeding. Rectal examination is more dangerous for the same reason, and has no place in placenta previa at any stage.

Do not pack the cervix or vagina before hospitalization. It is never surgically clean and hence invites infection which is doubly dangerous in these patients because of blood loss. Furthermore, it practically never controls the bleeding to any extent. To those of us who have recovered frequently an obviously dirty gauze bandage or cotton pack from a bleeding vagina, it is perhaps the cardinal sin. It may result in a septic death, it may force the removal of an otherwise good uterus, it may result in forcing delivery from below and the loss of a good baby. And one is tempted to say it never accomplishes its purpose and always wastes valuable time and blood.

There are, broadly speaking, three schools of thought regarding the best treatment of placenta previa. (1) That all cases shall be delivered from below by bags or Braxton Hicks version or both, unless the patient is a primipara with a long tight cervix. In these circumstances cesarean section is permitted. This is the older opinion taught by Williams and still followed in large measure, at the Johns Hopkins Clinic and by its graduates, such as Stander of New York and Plass of Iowa City. (2) That practically all cases of placenta previa shall be delivered by abdominal cesarean section of one or the other type. This is the point of view particularly insisted upon by Bill of Cleveland, DeLee and Greenhill of Chicago, Potter of Buffalo, Siegel of Baltimore and the practice followed in many clinics. (3) That each patient should be individualized, and depending on the conditions outlined in paragraph one of this paper, a decision to deliver from below in certain instances or from above in others is made. This is the point of view best advocated by Irving of Boston.

I have considered recent representative opinions from different parts of the country based on relatively small series of cases, and hence to be viewed with a critical eye. I now wish to present recently compiled statistics, to be viewed for the stated reasons with an equally critical eye. These statistics cover just under 6000 cases of placenta previa. This compilation was made in 1932 by D. V. Hazen, fourth year Harvard Medical School. His table shows:

It is most desirable to obtain long series of cases of placenta previa done in one institution to minimize statistical error, and to enable us to draw just conclusions.

Contributions to the subject from the Boston Lying-In Hospital are four in number. Stated chronologically, they are as follows: In 1921 the writer published a review of the first 218 cases (beginning in 1895 ending in 1919) of the series. This showed conclusively, that accouchement forcé had no place in the treatment of placenta previa of any type, though it had been the routine treatment in the clinic from before 1895 to 1915; and that by resorting to Braxton Hicks' version and the Vorhees bag, in only 57 per cent of our cases, we had reduced our mortality by over two-thirds namely to 6% in 66 cases. The exact figures are shown in table I.

This marked improvement in results encouraged those members of the staff who had come to believe in conservative delivery from below, and they confidently felt that with an increase in these methods we would obtain so good a maternal mortality that we could feel that the problem was solved.

That these hopes were not justified, in so far as the hospital went, was shown in a paper published by the writer in 1926, about five years after the first. These added years had brought the series to 303 cases. This table shows comparative results.

The staff during the years in question 1920 to 1925 worked quite independently and it was evident at the time, and is still more evident in retrospect, that though few cases were still delivered by rapid manual dilatation, internal podalic version and extraction, none the less, some men, though they went through the motions of Braxton Hicks' version or used the bag, hurried the delivery and did not adhere strictly to the rule against divulsing the cervix in any degree. This fact unquestionably contributed to the still too high mortality and is not properly shown in the table. I had demonstrated, I believe, in the earlier paper that the danger of lower segment rupture, so often fatal from hemorrhage or sepsis, lies in the last inch of dilatation. In some despair at our hospital figures, partly as a result of unfortunate personal experience on one summer service, and partly from a study of compiled statistics on the treatment of the condition by cesarean section, I "about faced" and advocated the broad use of cesarean section in all cases of placenta previa except those of the

Operation	Cases	Maternal Deaths	%	Cases	Fetal Deaths	%
Classical Cesarean Section	1579	63	3.98%	563	150	26.64%
Low Cervical Section	160	2	1.25%			
Vaginal Section	266	24	9.02%	260	137	52.7%
Voorhees' Bag	1055	56	5.3%	809	235	*29.05%
Braxton Hicks'	2140	109	5.1%	385	241	62.6%
Nothing or Rupture of Membranes	736	12	1.62%	367	125	34.1%

*Corrected.

marginal type. It is obvious, that this opinion was based on negative and not positive evidence and so demanded the persistence of an open state of mind. With the passage of time, this has been reacquired as will presently be shown. In defence of my point of view at that time, the following table shows my interpretation of the causes of death in the 47 cases that died.

TABLE III

CAUSES OF MATERNAL DEATHS

Hemorrhage and Shock	15
Hemorrhage and Shock, probably ruptured uterus	15
Undoubted Ruptured Uterus	6
Septicemia and Peritonitis	5
Pulmonary Embolus	3
Miscellaneous	3
Total Deaths in 303 Cases of Placenta Previa	47

It seemed possible to avoid most of these causes of death by abdominal section. Our hospital mortality was 10.5 per cent in general and 25 per cent in complete previas at that time so it appeared as though a change, at least experimentally, might lead to better results. In addition I was influenced by fetal mortality.

I said, "We lost 27 per cent of the babies of the 85 mothers either for nothing or to save more mothers, according to the point of view. Of 85 babies, 23 died who might have lived if they had not been subjected to delivery from below. I only question whether our maternal mortality justifies this."

Committed to this cesarean policy, as outlined I have adhered to it in practice ever since, whenever opportunity presented itself, except that on several occasions I have sanctioned instant cesarean section on marginal previas when very free bleeding resulted from vaginal examination for diagnosis. Always I have had re-

TABLE I

PLACENTA PREVIA

B. L. I. 1895-1919—25 years
218 cases; 38 deaths
Maternal Mortality, 13.5%

	1895-1915 19 Per Cent Maternal Mortality				1915-1919 6 Per Cent Maternal Mortality
	1895-1900	1900-1905	1905-1910	1910-1915	1915-1920
Number cases	18	26	42	66	66
Maternal mortality	17%	15%	24%	20%	6%
Percentage cases, bags or Braxton Hicks	0	0	2%	13%	57%
Percentage that died having manual dilation and extraction	100%	100%	100%	80%	100%
Number of maternal deaths	3	4	14	13	4
Maternal mortality, complete previas				36%	18%
Maternal mortality, incomplete previas				9%	0%
Fetal mortality				44%	48%

TABLE II

PLACENTA PREVIA 303 CASES, MATERNAL MORTALITY 19%

	Accouchement Forcé 152 Cases, Maternal Mortality 19%				Bag and Bipolar Version, 151 Cases, Maternal Mortality 8.25%	
	1895-1900	1900-1905	1905-1910	1910-1915	1915-1920	1920-1925 + six months
Number of Cases	18	26	42	66	66	85
Maternal Mortality	17%	15%	24%	20%	6%	10.5%
% Cases Bag or Bipolar Version	0	0	2%	13%	57%	76%
Number Maternal Deaths	3	4	14	13	4	9
Maternal Mortality Complete Previa				36%	18%	25%
Maternal Mortality Incomplete Previa				9%	0%	6%
Fetal Mortality				44%	48%	54%

current misgivings, remembering Dr. Newell's comments at the time. He said, admitting that it had a place in the treatment of placenta previa, that cesarean section is unnecessary if the baby is nonviable or dead, and that cesarean section with or without hysterectomy will not save moribund cases. These misgivings were not allayed by the next contribution from the hospital.

This was a paper by Irving published in 1927. Of his 57 personal cases 12 were complete, 16 were partial and 29 marginal. But two cases died, both of sepsis, a maternal mortality of 3.5. The percentages of still births among viable babies were as follows:

TABLE IV

	Per cent
Complete	55.6
Partial	61.5
Marginal	34.8

After a clear exposition of the problems involved, the diagnosis, rules for hospitalization without packing and insistence on an absolute regard for the integrity of the cervix, he writes:

"In view of our present knowledge, the ideal treatment of placenta previa may be stated as follows:

"If the patient is uninfected and her condition poor from loss of blood she should receive a preliminary transfusion. A Braxton Hicks version should be done forthwith regardless of the state of the infant, because it is the quickest way to stop the hemorrhage.

"If the patient is uninfected and her condition good but the baby dead, nonviable, or a monster, she should also have a Braxton Hicks version because it has the lowest maternal mortality and the baby in this case need not be regarded.

"If the patient is uninfected and her condition good and the baby alive, normal, and of sufficient size to warrant the assurance of survival, cesarean section should be done, as in this way the baby will be saved and the mother's life not unduly jeopardized.

"Simple rupture of the membranes in marginal placenta previa is safe for the mother but no better than metreurysis for the baby."

He also felt that, if the patient was probably infected when first seen, she should be sectioned followed by hysterectomy.

The only justifiable criticism of these conclusions is that the series is small and that just over half the cases were marginal in type and that only 21 per cent were complete. It was in complete cases that our general hospital mortality was so high. I believe the study of the last eight years about to be figured here, will go far to nullify this criticism.

If you accept Irving's criteria for cesarean section in placenta previa, you must figure carefully on your own hospital's premature death rate, in order to restrict the use of abdominal delivery to potentially live babies. Furthermore, time permitting, x-ray should be added to palpation to rule out monstrosities, relatively so frequent in placenta previa.

The last contribution from our hospital was made by the writer in 1930 under the title "Observations on a Short Series of Placenta Previas Delivered by Abdominal Cesarean Section at the Boston Lying-In Hospital."

This paper pointed out that cesarean deliveries had steadily increased in number from 1926 to 1930 and described the "two team" method; the absolute necessity for a completely prepared operating room for cesarean, prior to diagnostic vaginal examination, with boiled instruments on the table and personnel scrubbed, gloved and gowned, whatever the probable diagnosis and whatever the final method of delivery should be.

I stated that cesarean section is a menace and not a help unless this can be accomplished. If it cannot, one should stick to delivery from below.

The new material to be reported now includes all cases delivered from July 1, 1925 to May 1, 1933, a period of nearly eight years. In addition, it includes a small series of cases delivered prior to this date by cesarean section, some not included in my earlier reports, to be exact six, in addition to one previously included. With these, 135 additional cases are in the records. One is omitted from the statistics because she was delivered in the private ward, by a man not on the Lying-In staff. Our whole series to date numbers 437 consecutive cases from January 1, 1895 to May 1, 1933. During this time 39,986 cases have been delivered in the Boston Lying-In Hospital. Therefore, the incidence of placenta previa over this long period of time is one case to 91+ deliveries.

In general it may be said that most of the statements made early in this paper with regard to prehospital diagnosis and treatment have been confirmed in several instances. The outstanding difference in the last eight years has been that of 127 cases coming into the hospital in these latter years, (the earlier cesareans are omitted), but seven were in bad condition, none were moribund. All others are shown by blood pressure readings and pulse to have been in reasonably good condition on entrance. This demonstrates a striking improvement on the whole, in prompt hospitalization, both in our own prenatal cases and in cases sent in as emergencies by private physicians.

The 134 cases are divided into two groups, those delivered by cesarean section in one, those delivered through the vagina in the other. Regarding this second group this may be said, and it has never been possible to say it before; in no record, except as indicated in the "cause of death list," is there the slightest evidence that the cervix in any portion was ever forcibly di-

lated. The use of the Vorhees bag and Braxton Hicks' version with or without a weight, used singly or in combination, have been the sole methods used to effect effacement of the cervix, with the few noted exceptions, save in cases where normal labor and a low presenting part or artificial rupture of the membranes sufficed. This shows that we have a whole staff now educated to the only proper method of delivering placenta previa cases from below. It is over fifteen years since this theory was advanced and proved.

The statistics follow:

Previously reported	303	
Total cesarians in new series	56	
Total cesarians prior to new series not previously included	6	(in number, 7 in series)
	62	
Total delivered from below in new series	72	
Total new series	134	
Total cases reported to date	437	
Total deaths in cesarian series—New series		2
Total deaths in cesarian series—Old series		3
Percentage death rate in cesarian—		
New series (56 cases)		3.5%
Old series (7 cases)		43%
Total cesarian death rate to date—Combined		8%

	Complete Series		New Series	
Number of complete previas in cesarian series	27	45	25	41
Number of partial previas in cesarian series	18		16	
Number of marginal previas in cesarian series	17		15	
Number of complete previas in cases delivered from below	10	31		
Number of partial previas in cases delivered from below	21			
Number of marginal previas in cases delivered from below	42			
Number primiparae in cesarian series	9		7	
Number 4 para + in cesarian series	31		28	
Number primiparae in delivery from below	6			
Number 4 para + in delivery from below	44			
Total deaths in new series delivered from below			5	
Percentage deaths in cases delivered from below	6.8%			

	Late	Total
Transfusions in cesarian series	2	11
Transfusions in delivery from below series		9

	Yes	No	Not Stated
Vaginal examinations in cesarian series in hospital	42	15	5
Percentage of sections done without diagnostic vaginal	30% (approximate)		

I shall not burden you with the statistical details except to say that there were 72 cases delivered from below and 62 by cesarian, 56 in the new series seven in the old. The maternal mortality on cases delivered from below was 6.8. The mortality by cesarian in all of them was 8 per cent to 43 per cent in the first seven cases, three and one half per cent in the last 56 cases. The combined maternal mortality in the 129 new cases is 5.4 per cent. One baby died that weighed over four pounds in the cesarian series. Sixteen similar babies died in the delivery from below series. Thirty per cent of the cesarians were done without vaginal examination for diagnosis. The causes of maternal deaths were the following:

CAUSES OF MATERNAL DEATH IN NEW CESARIAN SERIES:

(1) Hemorrhage. Placenta accreta. Primarily due to loss of blood while waiting preparations for cesarian after vaginal examination. Central previa. (Autopsy.)

(2) Hemorrhage. Secondary hysterectomy done in effort to save patient. (Autopsy.) Central previa.

IN OLD CESARIAN SERIES:

(1) Peritonitis. Marginal previa. (Autopsy.)

(2) Hemorrhage or embolus. Died on table while being transfused. Central previa. (No autopsy.)

(3) Uterine sepsis and septicemia. Marginal previa. (?) (No autopsy.)

CAUSES OF MATERNAL DEATHS IN DELIVERY FROM BELOW SERIES:

(1) Sepsis. Pelvic abscess, pyemia. This patient was in bad condition, B. P. 70/40, and had a cotton pack on entrance. Marginal previa. Delivered Braxton Hicks, allowed to come out of ether and delivered without cervical trauma. (Autopsy.)

(2) Undelivered. Died just after introduction of Vorhees bag of "coronary embolus". Marginal previa. (No autopsy.)

(3) Died of "cerebral thrombosis" with psychosis. Death in no way connected with previa. Delivered by Braxton Hicks' version. Probable diagnosis: Encephalitis lethargica. Partial previa. (No autopsy.)

(4) Died of sepsis, pyemia, negative blood culture. Marginal previa. Bag and Braxton Hicks, but bag did not work well, and it is noted "after some difficulty the left foot was found *after dilating up the cervix*". Septic before delivery finished. (Autopsy.)

(5) Died of peritonitis. Ruptured uterus and broad ligament. Cervix sewed. Hysterectomy with drainage. Partial previa. Breech *extraction* after bag. It is noted "with considerable traction baby delivered dead". (Partial autopsy.)

(6) Private, hence omitted from statistics. Bagged to five fingers' dilatation, then rapid extraction. Died of hemorrhage, and probably ruptured lower segment. Partial previa. (Included for emphasis regarding cervix.) (No autopsy.)

Combined mortality in 134 newly reported cases including old cesarians	7+%
Combined mortality in 129 new cases (omitting old series cesarian)	
Total mortality in new cases	5.4%

FETAL MORTALITY IN CESARIAN SERIES

Number live babies 48

1 baby died of "prematurity". Weight at birth 4¹⁰.

Number dead babies 15

either macerated, monsters, without fetal heart on entrance, or weighing under four pounds (one set twins).

Only one baby four pounds or over normal and with fetal heart died.

FETAL MORTALITY IN DELIVERY FROM BELOW SERIES

Total number live babies	24
Total number dead babies	49 (1 set twins)
Number of dead babies four pounds or over and with fetal heart	16

These 16 babies might have lived had the mothers had sections.

The only comment I care to make on these statistics in this place is this: Of the six patients that died following delivery from below, two deaths had nothing to do with the delivery, since one died undelivered and the other of encephalitis lethargica on the eleventh day without evidence of pelvic sepsis. In each of the other four deaths the cardinal rules were broken either from choice or what appeared at the time necessity. One bled out and packed with cotton outside the hospital, died of sepsis. The second died of sepsis after the cervix had been manually dilated. The third, a large breech, died of ruptured uterus and peritonitis with the record note "with considerable traction baby delivered dead". The fourth died of hemorrhage, probably ruptured uterus following a rapid extraction when bag dilatation failed at "five fingers".

There remains to be considered general questions coming from a study of these cases not elsewhere regarded. The first of these is the question of sepsis. In previous studies from our hospital even in the cases that recovered the septic morbidity has always been high in placenta previa. Except the cases that died, in only one case in each series was there severe sepsis. A few had a moderate or mild degree of sepsis. There were the usual temperature rises from pyelitis and cystitis and breasts. Rather more patients than in normal cases had phlebitis and embolus. This relative freedom from sepsis which we have not before experienced, can only be attributed to early hospitalization, to the fact that by both methods the cervix has been respected, and the prehospital pack seldom used. It is remarkable, in view of the loss of blood prior to delivery.

Severe bleeding, considering the condition, has been singularly absent. This is indicated by the fact that in 134 patients it was found necessary to transfuse but 18 for hemorrhage, nine in each series. Bleeding from the placental site in cases delivered by cesarian, has several times been troublesome. Sometimes this was controlled by suture of the placental site, on occasion hysterectomy has been deemed wise. In this connection it is my belief on theoretical grounds only, that the uterus should not be immobilized during cesarian for placenta previa, a technique used by many operators, lest this immobilization tend to interfere with the contraction of the uterine muscle which closes the sinuses. However, since the lower segment is known to be relatively noncontractile it is not surprising that this phenomenon should occasionally occur. It is not common.

We have adhered in general to the proposition that an incision slightly higher than the low classical, and not in the cervix, thus avoiding the placental site, is best. Some cases in the series had various types of cervical incision. From these we have had the most trouble with bleeding. The relative merits of the low classical, as against the cervical incision, will be considered in the discussion by Dr. Phaneuf.

SUMMARY AND CONCLUSIONS

This is the first opportunity we have had to compare in our own hospital, two groups of cases delivered by cesarian section and by conservative delivery from below. What conclusions may we draw as to the relative merits of the two methods? It seems to me that as yet we can only say, as in the opening of this paper, that the best treatment for patients with placenta previa is not yet certain. By juggling our figures and indulging in "corrected" mortalities it would be possible to argue strongly either point of view, but we would prove nothing.

Certain statements may be made and further experience will supplement and correct these.

(1) We are able to produce by the combined method the best general hospital maternal mortality in a good-sized series of cases we have ever had. This is 5.4 per cent in 127 cases unselected.

(2) We are sure that cesarean section saves many babies lost by delivery from below.

(3) We see that cesarean section, including our earlier cases, fails to give us as good maternal results as I had hoped, or as good results as our deliveries from below, or as good results as other individual operators report in small series, or as good results as compiled statistics show. That it will give as good or better maternal results as conservative delivery from below, in our hands, is yet to be proved.

(4) We seem to show that cesarean section done by many different operators on the staff, on our *later* cases, gives in a series of cases somewhat longer, carrying a higher percentage of complete and partial previas than his, as good maternal mortality as that obtained by Irving, in his personal series of deliveries from below. A larger group is necessary to substantiate this.

(5) Hence, I think that the question of whether or not cesarean section is wiser on other than potentially good babies as advocated by Bill and by me, is at present decidedly an open question.

(6) We know that excellent results in maternal mortality may be obtained by delivery from below providing scrupulous care is used not to exert force on the cervix. Irving's series, plus the accumulated new data (including ten central cases and six primiparae) show this. The question, still open, lies in the fact, especially I think in marginal previas with large babies and more especially if these are breech presentations, that once in a while in all types of previa, bag or breech may fail to dilate the cervix gently and too much force must be used. The occasional coincidence of accreta is another condition to make one question delivery per vaginum. The badly scarred multiparous cervix is another. In the cases of lower segment rupture, in which I have personally figured, the rupture was never the result of deliberate hurry of unconsidered force but the result of necessity to get the baby out. Irving teaches that craniotomy answers this problem and saves the cervix. This is a very important point and should never be overlooked as a method of safely getting out of a bad situation.

(7) It is true that Braxton Hicks' version may at times be technically, extremely difficult; that the use of the Vorhees Bag, though simple, implies training in its use and a supply of intact bags. For these reasons, if the trained obstetrician is not available, it seems that better results will be obtained by using surgeons to perform immediate cesarean section rather than to risk the complications of a botched delivery from below. Further, if it has taken some ten years to educate the staff of the Lying-In Hospital really to regard the cervix in placenta previa, it is not surprising if the general practitioner has not learned it yet.

(8) It develops that the removal of a ruptured lower segment uterus ir a bled-out patient or even an intact uterus after cesarean section in placenta previa is not so simple or so safe as we have been led to believe. In this connection it is the writer's personal belief that it is safer and quicker to sacrifice the ovaries and control the blood supply at the infundibulopelvic ligament with a double tie, than to control it between the ovary and the uterus in tissue, often very friable at full term, and with the ovarian artery greatly enlarged, pumping in blood against this ligature.

(9) Little light is thrown on the question of how best to deliver the moribund patient, since patients in this series have not come to us in this condition. On mature consideration, it seems more rational to follow the plan outlined by Irving; to do Braxton Hicks' version holding it there till normal delivery as the quickest way to control the bleeding, with simultaneous transfusion, subsequently to be guided by events, rather than to follow the plan I have advocated of packs, transfusion, hysterectomy, and retransfusion. I am still very much afraid of a leaky, poor acting fundus in a thoroughly bled-out patient, and would rather it was out of the patient, but the process of getting it out has proved hazardous in itself. If it becomes necessary it can be done later on reaction, but no problem in obstetrics is more trying, none requires nicer judgment as to the exact moment to act, than the question of hysterectomy to control persistent oozing in a delivered placenta previa patient whatever the method of delivery has been. This necessity sometimes arises even with a sewed-up cervix and a packed uterus.

(10) The question of the better method of delivery from the simultaneous standpoint of mother and baby of the *marginal* previa remains to be settled. Bill, the cesarean advocate, permits delivery from below in certain of the cases; Irving, favoring delivery per vaginum except in the interest of the child, points out that the fetal mortality is too high in marginal previa whether simple rupture of the membranes is practiced or bags used. I feel that a future study, in more cases delivered both ways will throw light on this important question, the relative risk to the mother as against the relative safety for the child by cesarean. For my part at present I would rather follow the principle that delivery from below is the general choice in previas of the marginal type making exceptions for cause in certain instances with a live baby. One cause for exception is the lack of an available trained obstetrician. There is no question I think that marginal previas with a nonviable or dead baby, *should* be delivered from below except that if the patient is probably infected she should have a cesarean followed by hysterectomy. If the cervix fails to dilate fully with bag or breech, craniotomy to spare the cervix is indicated if enough dilatation has been obtained. If there is still little, and this is very rare, cesarean and hysterectomy are indicated

(11) I believe that improvement in mortality statistics in placenta previa throughout the state of Massachusetts depends much more on the promptness with which the unpacked, unexamined, bleeding pregnant woman is hospitalized by the practitioner and delivered by an obstetrician than on whether she is delivered through the natural passages conservatively or by cesarean section.

(12) And finally, I believe that with more time and experience, the obstetrician will de-

termine which of these two methods is better. If as seems quite likely, both have their place, he will learn more exactly the indications for each.

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COMPILED STATISTICS

	Cases	Mat. Deaths	%	Fetal Deaths	%	Corrected Fetal Deaths	%
CESARIAN SECTION							
Brodhed	48	5	10.8	5	10.8	1	2
Essen-Möller	7	1	14	2	28		
*Heinlein	1	0	0	0	0		
Depken	11	1	9	0	0		
Düsseldorf	48	2	4.1	5	10.4	3	6.5
*Ballhorn	10	1	10	1	10	0	0
Mallmö Gen'l Hosp.—Bauer	5	0	0				
Edinburgh—Watson and Miller	14	1	7.2	1	7.2		
Kiel Clinic—von Mikulicz-Radecki	31	1	3.3	7	21.9	0	0
B. C. H.—Lynch	6	0	0	1	17	1	17
				2,000	Gm.		
Zurich—Walthard	79	2	2.5	54	70	6	8
Bremen-Korthauer	29	2	6.9	5	17.3		
St. Mary's, Manchester—Lacey	33	2	6	4	13		
Munich—Söderlein Extra-peritoneal	35	4	11.3	10	28		
Intra	14	4	28.5				
*Vienna Women's Clinic—Högler	59	1	1.6	13	22		
*P. Balard	12	0	0			0	0
E. Puppel	26	0	0	6	23		
Cleveland—Bill	56	1	1.8	18	32.1		
T. Thiemke	27	2	7.4				
B. L. I.	40	1	2.5	10	25	6	15
Montreal Maternity—Burgess	12	2	16.67	4	33.3		
Karlsruhe—Wagner	18	1	5.5	4	22		
E. Frey	79	2	2.53				
M. Henkel	83	1	1.2				
*De Lee	44	0	0				
Siegel—collected	561	21	3.74				
Frey	88	1	1.14				
Portland, Ore.—Adams	18	1	5.5				
M. G. H.—Courtiss and Fisher	43	3	6.9				
	34	cervical					
*Chicago Lying-In—Greenhill	42	0	0				
				150 of			
Totals	1579	63	3.98	563	26.6		
*Indicates low cervical section	160	2	1.25				
METREURYSIS—VOORHEES BAG							
Schweitzer—collected	670	39	5.8			185	27.6
Depken	116	4	3.5			45	38.8
Heinlein	91	2	2				
Mallmö—Bauer	4	0	0				
B. C. H.—Lynch	23	0	0	16	69.5	5	22
Vienna—Högler	67	3	4.5				
T. Thiemke	19	3	16				
Williamson	65	5	7.7	31	47.7		
Totals	1055	56	5.3				

COMPILED STATISTICS (*Concluded*)

	Cases	Mat. Deaths	%	Fetal Deaths	%	Corrected Fetal Deaths	%
No Interference or Rupture of Membranes							
Essen-Möller	55	0	0	17	30.9		
Heinlein	10	0	0	0	0		
Depken	19	0	0	2	10		
Mallmö—Bauer	113	0	0				
Edinburgh—Watson and Miller	61	1	1.63	25	41		
B. C. H.—Lynch	5	0	0	0	0		
St. Mary's—Manchester	202	5	2.47				
Munich—Söderlein	46	2	4.3	23	50		
Vienna—Högler	119	2	1.7	36	30		
T. Thiemke	54	1	1.85				
Montreal Mat. Hosp.	52	1	1.92	22	42.3		
Totals	736	12	1.63	125 of 367	34.1		
Vaginal Section							
Essen-Möller	12	0	0	1	8.3		
Heinlein	1	0	0	0	0		
Mallmö—Bauer	6	0	0				
B. C. H.—Lynch	2	0	0	1	50	0	0
Munich—Söderlein	245	24	9.8	135	55		
Totals	266	24	9.02	137 of 260	52.7		
Braxton Hicks'							
Essen-Möller	51	1	2	35	69.8		
Heinlein	12	0	0				
Depken	26	4	15.4	13	50		
Düsseldorf	51	3	5.9	18	35.5		
Mallmö—Bauer	8	0	0				
B. C. H.—Lynch	4	0	0	3	75	0	0
Munich—Söderlein	58	4	6.9	51	88.3		
Vienna—Högler	111	10	9				
T. Thiemke	42	1	2.4				
Montreal—Burgess	21	0	0	17	80.95		
Schweitzer—collected	1266	68	5.4				
Rotunda—Jellett	138	5	3.69				
Hoffman, Behm and Lomer	178	8	4.5				
Stratz	110	1	0.9	70	64		
Douglas and Siegel	64	4	6.25	34	53.8		
Totals	2140	109	5.1%	241 of 385	62.6%		

D. V. Hazen, 1932.

DISCUSSION

Chairman Pemberton: The discussion of this excellent paper will be opened by Dr. F. J. Lynch, of Boston.

Fred. Lynch, M.D.: Several years ago I tabulated the statistics of the results of the treatment of placenta previa at the Boston City Hospital during a period of twenty years. During that period there were 91 cases. Of the 91 cases, 19 mothers died, a gross mortality of 20 per cent. This includes patients who were delivered outside the hospital, and those practically moribund at the time of entrance. Fifty-one babies were born dead, or died before leaving the hospital, making a gross fetal mortality of 55 per cent. Of this number 26 were nonviable, and two were macerated fetuses, making a corrected fetal mortality of 25 per cent.

The methods of delivery were as follows:

1. Accouchement Forcé	43
2. Bagging and Version	23
3. Braxton Hicks' Version	5
4. Cesarian Section	6
5. Packing Lower Segment and Vagina	6
6. Rupture of Membranes	5
7. Vaginal Cesarian	2
8. Incisions of Cervix	2

Of the 43 cases delivered by manual dilatation of the cervix, 15 died, a maternal mortality of 35 per cent. Twenty-eight babies died, of which 15 were nonviable, making a corrected fetal mortality of 35 per cent.

Of 23 cases treated by a hydrostatic bag, no mother died. Sixteen babies died of which 10 were nonviable, and one a macerated fetus, a corrected fetal mortality of 22 per cent.

The Braxton Hicks' version was resorted to in four cases, with four mothers and one baby dis-

charged well. The three babies that died were of nonviable age. Therefore there was no maternal or viable fetal death.

Six cases were delivered by cesarian section with no maternal mortality, and one fetal death due to hemorrhagic disease of the new-born, a fetal mortality of 17 per cent.

Of the cases treated by packing the lower uterine segment and vagina, of which there were six, three mothers died, making a maternal mortality of 50 per cent. Five babies died, four of which were nonviable, making a corrected fetal mortality of 17 per cent.

In those cases of marginal previa treated by rupturing of the membranes, all mothers and babies were discharged well.

Of the two vaginal cesarian cases, both mothers were discharged well. One case had been bagged, and after the bag remained in situ thirty-six hours without starting labor, a vaginal cesarian was done. The baby proved to be a macerated fetus. There was no maternal or viable fetal mortality.

In the two cases of multiple incisions of cervix, both mothers were discharged well. Both babies died, one of which was of viable age, making a fetal mortality of 50 per cent.

From the foregoing statistics it is immediately apparent that accouchement forcé in this series of cases, besides being the most frequent method of handling the condition, was likewise the one fraught with most danger to the mother and baby. The reason for this is that the placenta being inserted in the lower uterine segment makes that portion of the uterus much thinned out and very friable. Any attempt to dilate this tissue at all rapidly results not in dilatation, but in cervical tears which involve the lower uterine segment. This part of the uterus in placenta previa is abnormally vascular, due to the fact that it is the placental site and, when torn, results in profuse hemorrhage. This bleeding and the accompanying shock of the ruptured uterus, when superimposed on the already "bled-out" condition of the patient are frequently sufficient to cause her death. In several of the cases in this series which were treated by accouchement forcé and survived, the cervix was torn badly enough to require suturing, and one which showed immediate symptoms of ruptured uterus and collapse, was opened abdominally and a rent in the broad ligament repaired.

We use the Voorhees bag occasionally and it has given fairly good results for the mother and baby. The bag used should be chosen with the idea of being just larger than the baby's head. It may be inserted either "intraovularly", viz., through the membranes and placenta, and sit on top of that organ, or "extraovularly," that is, just inside the cervix between the placenta and cervix. The latter is preferable for two reasons: first, that it is easier; and secondly, that it applies the pressure to the bleeding surface, the exposed uterine sinuses. One would naturally expect that this separation of the placenta from the uterine wall by the bag would increase the chance of fetal asphyxia. While it probably does cause a temporary embarrassment of fetal oxygenation, the fact that the placenta in this condition covers such a large area makes the part separated by the bag relatively small and not enough to cause complete asphyxia.

The Braxton Hicks' operation gives the baby a poorer chance than any other method of delivery, and should be properly used only in cases where the baby is nonviable. In a vertex presentation, one of the baby's feet should be brought down through the degree of dilatation present. The version having been completed, the leg and thigh should be pulled through the cervix, and slight traction continued by means of a two-pound weight attached with a piece of tape to the foot. In this way the baby's thigh and buttocks exert a pressure on the placenta and lower uterine segment, thus controlling the hemorrhage. The rest of the dilatation should be left to nature and accomplished by uterine contractions, not as is frequently done by continuing the extraction until the baby is born. In four of the cases in this series, written up in the hospital records as the Braxton Hicks' operation, immediate extraction was performed. These cases have been classed with the accouchement forcé operation, for it makes no difference if the cervix is dilated immediately with the hand or with the baby's body and head, the end-results, so far as the cervix is concerned, are the same.

In our opinion cesarian section is the method of choice for delivery, either the low cervical type or the classical, depending upon personal preference. The multipara with a doubtful baby, a partial previa and a soft cervix is perhaps better treated with the bag, realizing that delivery from above may mean the necessity for cesarian section in subsequent pregnancies with its accompanying high mortality; an unfortunate operation for a woman with a normal pelvis.

It should be said, I think, that the individual who is unfamiliar with the use of bags will probably have better results treating all cases of placenta previa by means of a cesarian section.

In considering a group of cases of this kind, it must be kept in mind that the patients presented wide differences in regard to the condition in which they arrived at the hospital, amount of blood lost, degree of previa, period of gestation, and the amount of manipulation outside the hospital. However, it seems fair in view of the foregoing statistics to conclude that the treatment of placenta previa should be immediate delivery, except those cases which are in profound shock and collapse, when it may be better first to combat this situation with transfusion and appropriate shock treatment. An expectant policy may also be reasonably adopted in the case of the patient who has bled but little, with a baby close to the period of viability, and who is under close observation in a well-equipped maternity hospital.

We feel that accouchement forcé has not been followed by good results; that the hydrostatic bag and the Braxton Hicks' version are the methods of delivery of choice in some cases of marginal placenta previa; that cesarian section is the treatment which should be employed in the great majority of these cases.

CHAIRMAN PEMBERTON: The discussion will be continued by Dr. L. E. Phaneuf, of Boston.

LOUIS E. PHANEUF, M.D.: Dr. Kellogg, in his instructive and well documented paper, has brought to our attention, one of the most formidable complications of pregnancy, namely, placenta previa.

In discussing the treatment he has alluded to the three schools of thought: 1, delivery from below by bags, by Braxton Hicks' version, or both; 2, by abdominal cesarean section; and 3, by individualization of each patient, with delivery from below or by cesarean section, when either method best serves the interests of mother and child.

His emphasis on "the respect of the cervix" and his implication that the badly scarred multiparous cervix is a contraindication for delivery from below are, it seems to me, two very important points in his essay.

When hysterectomy becomes necessary in the treatment of this disorder, I have found by experience, that it is far safer to ligate the ovarian vessels in the infundibulopelvic ligament, rather than

close to the uterus in the ecchymotic, friable tissue. Hemorrhage is far better controlled by the former method, even though it entails the sacrifice of the ovaries, than by the latter, as brought out by Dr. Kellogg.

I personally favor cesarean section in the treatment of most placenta previas and prefer the low or cervical cesarean section for three reasons. First, because after the removal of the child and the placenta, it is possible, by proper retraction, to inspect and suture the placental site, thus controlling the bleeding from this source before closing the incision. Secondly, because it has been shown, in large series of cases, that the low or cervical method protects the puerpera against peritonitis and, since anemic patients are prone to infection, this extra safeguard reacts in their favor. Thirdly, because if a hysterectomy becomes necessary, the bladder is already separated, the uterine vessels are identified and the procedure can be carried out in a few minutes with resultant blood conservation. If the transverse cervical incision is used in performing the operation, this becomes simplified by the fact that the cervix is already half amputated.

In looking over my personal records covering a period of fourteen years, I find, that I have done 25 low or cervical cesarean sections for placenta previa.

Central placenta previa	17—primiparae	10—multiparae	7
Marginal placenta previa	3—primipara	1—multiparae	2
Lateral placenta previa	5—primipara	0—multiparae	5
Total	25 primiparae	11 multiparae	14

Twenty-four mothers so delivered survived and one died, a maternal mortality of four per cent. The mother who died was a primiparous patient with a central placenta previa, who had had a previous laparotomy for pelvic inflammation. The cause of death was acute gastric dilatation and intestinal paresis. She had had a blood transfusion and a jejunostomy under local anesthesia. A partial necropsy had revealed no peritonitis.

Twenty-seven babies were delivered, there being two twin gestations. Four babies did not survive, a gross fetal mortality of 14.8 per cent. One child was stillborn while three others were premature infants, the pregnancy having reached seven and a half months in each instance.

If we analyze these twenty-five cases of placenta previa by their varieties we arrive at the following figures:

	Mothers				*Infants*			
	No.	Lived	Died	Per Cent	No.	Lived	Died	Per Cent
Central placenta previa	17	16	1	5.8	18	14	4	22.2
Marginal placenta previa	3	3	0	—	3	3	0	—
Lateral placenta previa	5	5	0	—	6	6	0	—
Total	25	24	1	4.0	27	23	4	14.8

The essayist has brought to our attention the importance of blood transfusion in the treatment of placenta previa. In my series this was administered to two women having central placenta previas.

I am in complete accord with Dr. Kellogg that the last word has not been said in the treatment of placenta previa; but feel that when cesarean section is indicated, the low or cervical operation finds a distinct field of usefulness in the treatment of this severe complication of pregnancy.

CHAIRMAN PEMBERTON: The papers are now open to general discussion. If there is none, will Doctor Kellogg please close?

DOCTOR KELLOGG: I have nothing further to say.

CHAIRMAN PEMBERTON: We will go on to the last paper, which is on "The Use of Pituitary Extract in Obstetrics," by Dr. Carmi R. Alden, of Newton Center.

THE USE OF PITUITARY EXTRACT IN OBSTETRICS*

BY CARMI R. ALDEN, M.D.†

PITUITARY Extract (Liquor Pituitarii U.S.P.) is a solution of the water soluble principles from the fresh posterior lobe of the pituitary body of cattle. It is standardized into international units. The activity of one half milligram of standard dry extract on the isolated muscle of the uterus of a virgin guinea pig is defined as one international unit. Various names of the product commercially are Pituitrin, Pituitary Solution, Pituitary Extract, Infundin, etc.

There has always been a question as regards the relative clinical merits of these various preparations. The explanation of this is as follows: first, the U.S.P. allows a variation of from 80 per cent to 120 per cent; secondly, the number of units in an ampoule vary. Thus there are one cc. ampoules containing ten units; one cc. ampoules containing five units; there are five-tenths (.5) cc. ampoules containing five units, and five-tenths (.5) cc. ampoules containing two and a half units. There is no difference between the surgical and obstetrical solutions of pituitary extract except that the obstetrical solution is more dilute; that is, contains fewer international units. Most ampoules of surgical pituitary extract contain twenty units per cc. Some manufacturers do not specify surgical or obstetrical solutions, but simply specify the strength of the solution in units. This would seem to be much the more satisfactory and definite way of specifying strength. As it is important to know exactly what solution one is using, both for clinical purposes and for purposes of discussion, ten international units per cc. is the strength referred to in this paper.

*Read before the Section of Obstetrics and Gynecology at the Annual Meeting of the Massachusetts Medical Society at Boston, June 5, 1933.

†Alden—Visiting Surgeon for Gynecology and Obstetrics, Boston City Hospital. For record and address of author see "This Week's Issue," page 1246.

Physiologically, pituitary extract contains hormones which can produce at least three definite activities; namely, stimulating non-striated muscle contraction (oxytocic action); the ability to raise the blood pressure (pressor action); and its marked diuretic and anti-diuretic effect (renal action). The pressor and oxytocic principles have been separated, but the ordinary pituitary extract contains both in equal units. Commercially these separated principles are marketed as Pitocin (oxytocic principle) 10 units per cc., and Pitressin (pressor principle) 20 units per cc. The clinical application of the oxytocic principle, without the pressor principle, would naturally be suggested for those obstetrical cases where it would be detrimental to increase the blood pressure which is already too high, such as the various toxemias and eclampsia. The dosage used is the same as for pituitary extract.

Pituitary extract is used in the induction of labor in several ways. Alone it is not very effective for this purpose, but once irritability and slight contractions have been established, the extract is of value in producing and accelerating labor. The following technic is common in cases of multiparae. Two ounces of castor oil and 15 grains of quinine bisulphate are given. One half hour later, five grains of quinine bisulphate are given. One half hour later a hot soapsuds enema is given, followed in one half hour by two minims of pituitary extract which is repeated at half hourly intervals for six doses provided the patient does not in the meantime start in labor. As soon as the patient is actually in labor and having contractions, the administration of pituitary extract is stopped.

In primiparae the amount of pituitary extract is reduced to one minim every half hour for perhaps six doses. This is a precaution which is taken in order to guard against the possible production of too forceful contractions against the rigid cervix of a primipara.

Experimentally the effect of pituitary extract reaches a maximum in one half hour after intramuscular injection, and then fades rapidly. Clinically the maximum effect seems to be reached much sooner. This technic is quite successful provided the patient is near enough at term so that certain changes in the cervix, a shortening and taking up, have occurred, but it will not with any degree of regularity induce labor earlier in the pregnancy. In combination with this technic, stripping of the membranes for as far as the fingers can reach within the cervix is a distinct aid. The method of inducing labor by rupturing the membranes may or may not be followed by small doses of pituitary extract, depending on the size of the baby and type of cervix.

Since the carrying out of this treatment is practically always left in the nurses' hands, it is of the utmost importance that a syringe be used which is calibrated so that one or two minims can readily be measured, and that the nurse be thoroughly familiar with her responsibility for the accurate measuring of the dosage.

As a variation of the foregoing technic, pituitary extract may be administered on a cotton pledget soaked in the solution and applied intranasally. The advantage of this technic is that the pledget may be removed as soon as evidence of contractions presents itself, thereby prohibiting any further absorption of the pituitary extract. However, even here one may get a violent or a sluggish action.

Similarly for uterine inertia during the first stage of labor, pituitary extract may be given in doses of one minim under careful supervision to stimulate uterine contractions. It cannot be too highly stressed that the carrying out of such procedures should take place only in a well-supervised maternity ward after a careful and accurate diagnosis. This, in combination with careful and accurate measuring of dosage, and constant observation of the obstetrician himself, or an obstetrical supervising nurse of long experience, will reduce the dangers to a minimum. Many obstetricians limit the amount of pituitary extract used in these instances to one dose of two minims. It might also well be said that in the first technic mentioned for induction, some obstetricians feel that there is a distinct danger to the child from the quinine which is a definite cardiac depressant. Also some patients have a hypersusceptibility to quinine. That is why the quinine, if used, is best given in divided doses.

Because of variations in the state of irritability of the uterus in different cases and the extremes of response to pituitary extract caused thereby, the wisdom of ever administering it, before the second stage of labor, may be questioned. Excessive use of pituitary extract during the first stage will result in violent tetanic contraction of the uterus; a rise in the pulse rate, extreme pallor and vomiting. The body of the uterus, the lower uterine segment, or the cervix, may at any time rupture. A hot bath will often relieve the tetanic contraction, or deep etherization may be instituted.

During second-stage labor in those cases in which there is absolutely no obstruction to the birth of the child, and the reason for the delay is the lack of force in the uterine contractions, pituitary extract may be used in doses of from .5 cc. to 1 cc. It is better not to repeat this dose in case expulsion does not take place, for such repetition may cause a distinct shutting down of the uterine musculature about the child. The cervix becomes thick and rigid and a condition very similar to contraction ring is

produced. Such an outcome is usually the result of a mistake in diagnosis, such as an arrested, unrotated posterior position, or perhaps a cervix not fully taken up and dilated. I am much more inclined to use pituitary extract in primiparae in left anterior positions than in right posterior positions, for the tremendous expulsive forces brought to bear may produce too rapid descent and little if any rotation.

Of late years, there has been quite a widespread custom of administering pituitary extract in full doses immediately after the baby is born, to prevent undue bleeding and also on the theory that the stimulated uterine contractions accelerate the separation and the birth of the placenta. In the majority of cases this is true, but in a certain percentage of cases, the uterus, and especially the lower uterine segment, including the cervix, close down sufficiently to actually obstruct delivery of the placenta. For this reason, in some clinics, the routine use of pituitary extract following birth of the baby, and before the birth of the placenta, is now in the process of abandonment.

Once the placenta is born, however, there is general agreement that the routine intramuscular injection of the full dose of 1 cc. of pituitary extract is indicated; followed by, or coincident with, an injection of ergot. The effect of the pituitary extract is noted at once and lasts about a half hour, while the ergot acts more slowly but lasts longer and is having its best effect by the time that the effect of the pituitary extract wears off. In instances where one dose does not control bleeding, or where there is a later relaxation of the uterus, a dose of 1 cc. of pituitary extract may be repeated, always bearing in mind the possibility of a so-called pituitary extract reaction. If a patient is properly watched following delivery, it would seem that there is no real need for administering pituitary extract unless undue bleeding occurs.

In cesarean sections, pituitary extract is of great value in causing the uterus to shut down, and in the control of bleeding after the extraction of the baby. The method of injecting the pituitary extract directly into the muscles of the uterus has fallen into disuse, and intramuscular or intravenous injection is now chiefly employed. The intramuscular injection is made at the moment of incision into the uterus, 1 cc. being the common dosage.

If intravenous injection is to be used, it should be decided upon in the beginning and not given on top of one or two intramuscular injections. Preparation should be made so that it is given not before and not too long after the extraction of the baby. It may well be diluted with five to ten cc. of normal salt solution. Like all intravenous injections, it is paramount that it be given slowly, and that the solution be slightly warm.

I believe that these two factors, plus the giving of intravenous injections in addition to one or more previous intramuscular injections, account for many of the pituitary extract reactions. This reaction consists of a sudden collapse of the patient. The picture is that of surgical shock. The pulse is weak and thready. The patient is cold and clammy. The blood pressure drops and there is vomiting if the patient is not too deeply anesthetized. The treatment of this condition is the same as that for shock. Heaters and blankets, elevation of the feet, and caffein sodio-benzoate intravenously. Adrenalin may be administered. This is usually successful in a comparatively short time in restoring the pulse, and the patient's general condition rapidly improves.

Physiologically, pituitary extract momentarily lowers, then raises the blood pressure; then with increased or repeated doses, the blood pressure falls. The rise in blood pressure is not so high as with adrenalin, but it is more prolonged. Some men make a custom of adding three minims of adrenalin to each injection of intravenous pituitary extract to prevent this reaction. Theoretically, it is a little hard to rationalize this procedure, but I have never known of a case of reaction when this has been done. Cases in which a reaction is apt to occur are those in which full doses of pituitary extract have been given, and who have already undergone sufficient strain due either to a long, difficult labor, or various operative procedures. Due to the fact that the tonic action of pituitary extract upon the arterial system has led to its employment for combating shock and collapse, it seems a little strange to have it produce this identical picture itself. I have had an opportunity to carry out the intravenous injection of full doses of pituitary extract on dogs which had been subjected just previously to various procedures so that their condition corresponded to that of a patient following extensive or prolonged operative procedures. In some of these cases, I have been able to get graphs which showed at first a rise in blood pressure, followed shortly by a definite, marked drop. I have not had enough of these cases to form any definite experimental proof, but I am simply mentioning this for what it is worth.

During the puerperium, one of the complications often met with is subinvolution. Pituitary extract is of value in these cases, in conjunction with ergot, the best method being to give small doses such as four to eight minims three times a day in order to have the effect prolonged in conjunction with ergot. Pituitary extract is used to stimulate unstriped muscle fibres of the intestine and bladder in atonic condi-

tions. In postoperative distention following cesareans, it may be administered every four hours in full doses. The efficiency of enemata in cases of intestinal paresis is increased if an intramuscular injection of pituitary extract is given a half hour previously. Retention of urine during the puerperium, a not uncommon complication, due to atony of the traumatized bladder is often favorably influenced by repeated injections, three times a day, of pituitary extract intramuscularly.

Pituitary extract is contraindicated in cases of toxemia with high blood pressure, nephritis, myocarditis, and arteriosclerosis.

Labor is a battle between the forces of expulsion and the forces of resistance. Pituitary extract should never be used unless the forces of expulsion can easily overcome the forces of resistance. My colleagues and I have seen cases of rupture of the uterus due to the faulty use of pituitary extract. Many texts state that spontaneous rupture of the uterus is possible, and I have heard of such cases at second hand. However, in a case that did not have a scar in the uterus from a previous rupture, or a cesarean incision, if it can be established that pituitary extract has been used, the rupture should be attributed to the pituitary extract.

Pituitary extract is a wonderful aid in the treatment of certain dystocias when properly used, but is loaded with dynamite when improperly used.

DISCUSSION

CHAIRMAN PEMBERTON: The discussion of this paper will be opened by Dr. D. L. Jackson, of Boston.

DELBERT L. JACKSON, M.D.: *Mr. Chairman, Fellow Members of the Massachusetts Medical Society and Guests*—I wish to thank Dr. Alden for the privilege of reading his paper and for the opportunity to discuss the subject before you at this time.

The value of and indication for the use of pituitary extract in obstetrics have been argued back and forth, pro and con, ever since the extract was first introduced to the medical profession. It has been asserted many times that the dangers of using pituitary in the practice of obstetrics were so great from the point of view of both the mother and the baby that it should never be used in labor. Too much of every useful thing leads to danger and it is my personal belief that the majority of accidents and bad results following the use of pituitary extract have been due to faulty judgment in regard to the indication for its use or to indiscreet dosage in its administration.

Experimentally, pituitary extract is shown to have great effect on the activity of uterine muscle. Clinically, then, it would seem that any drug producing this activity should have a useful and safe place in obstetrics, if proper regard is maintained for its indications and dosage.

Dr. Alden has dealt minutely with the methods for determining the potency of the extract and has pointed out the wide variation in the strength (in other words, the activity) of the products marketed by the different commercial drug concerns. To my mind, this latter situation leads to confusion and increases the chances of dangerous complications in the use of these varying pituitary extracts, as we go from one hospital to another, ordering its use. Why attach the names "obstetrical" or "surgical" to pituitary extract? The drug manufacturers do not give us morphia under one name for the relief of pain following abdominal operations and under another name for the relief of puerperal after-pains. Why can't we have a uniform extract and order 0.2 or 0.5 cc. or three or seven minims of the solution, as our judgment dictates, instead of having to determine our dosage after finding out whether the particular extract employed contains five or ten or twenty international units per cc.?

My experience in the use of pituitary extract during labor has gone through many phases. Most of the changes have been toward reducing the amount and frequency of administration of the extract. Very early in its use it seemed clinically that small doses gave just as good results as the injection of the full 0.5 cc. ampoules, so that for the last several years rarely more than three minims have been injected intramuscularly at a time, before the birth of the baby.

Response to pituitary extract depends greatly on the stage of labor and more particularly on the condition of the cervix.

A few years ago I wrote a paper entitled "Induction of Labor by Rupture of the Membranes and the Administration of Pituitary Extract." The technique, as indicated by the title, called for the injection of pituitary extract, minims three to minims five, after the membranes were ruptured. In the light of experience from this work I have learned that the effect of pituitary on a uterus, with the cervix not effaced, is not dependable or satisfactory but tends to cause a type of uterine contraction not unlike that seen in "false labor". Also, one can expect that under this condition even these ineffectual contractions will decrease as the effect of the drug wears off.

After the cervix is "taken-up" the reaction to pituitary is much greater and the labor will undoubtedly be increased in severity and rapidity. It is to be said, however, that when labor has effaced the cervix its progress will usually be so satisfactory that further stimulation is not necessary.

Should inertia of the uterus occur and contractions cease, pituitary extract will almost always cause labor to resume; the small dose is still all that is necessary.

I am not in sympathy with the rather frequently repeated doses of pituitary in labor, as I feel that this form of treatment predisposes to the tonic uterus. In general it would seem that the conditions which suggest the frequently repeated doses would be better treated by morphine or morphine and scopolamine, etc., giving the patient a rest until labor assumes its normal rhythm.

Intravenous administration of pituitary extract in obstetrics should have special consideration both because of its value to the obstetrician and because of the definitely limited indications for its use. I believe it to be the greatest asset to the security of the doctor and the safety of his patient that has been given us in years.

Intravenous pituitary extract is never indicated during labor except in the third stage, as given below under indication number three. The indications for its use are the following:

1. In postpartum hemorrhage due to an atonic uterus.
2. In cesarean section after the baby is delivered
3. In an occasional case of retained placenta after delivery from below.

The amount of the extract injected intravenously should again, in my opinion, be limited from minims three to minims five of the solution containing ten international units to one cc.

It is certainly remarkable to see the open cesarean uterus contract and express its placenta spontaneously within a few seconds of the injection, or to feel an atonic postpartum uterus shut down as firm as a rock almost immediately after the withdrawal of the injecting needle from the arm vein. These firmly contracting uteri cannot bleed, and saving blood means saving lives.

To illustrate by statistics one of the benefits traceable to the use of intravenous pituitary extract; at the Boston Lying-in Hospital, in 1928, a total of seventeen uteri were packed for postpartum bleeding, whereas in 1929, with the introduction of this method of treatment, there were only two cases where packing was necessary, and since that time the number has been negligible.

Dr. Alden has spoken of the occasional case of "pituitary shock" following the intravenous use of the extract of pituitary. I also have seen a few cases exhibiting this condition but none of them were severe reactions, nor were they of long duration. In each of these the patient became pale and the respirations moderately shallow, with marked slowing of the pulse rate (45-48). Recovery, however, began almost immediately without additional medication and at the end of five or seven minutes all was quite normal again. I believe the chances are that good results may be obtained and distressing shock reactions avoided, if the dosage is maintained at low limits.

CHAIRMAN PEMBERTON: The discussion will be continued by Dr. T. F. O'Brien, of Worcester.

THOMAS F. O'BRIEN, M.D.: We are indeed fortunate in hearing such an excellent paper as that presented by Dr. Alden this afternoon. As he has covered the matter thoroughly there is little that can be added. However, I was particularly pleased to hear him state that pituitary extract is of little good in induction of labor except when near or at term. This has been my experience and in such cases castor oil or small doses of quinine or the combination acts fully as well if not better without the dangers.

I believe that, during the first stage of labor, pituitary extract is absolutely contraindicated. Those cases of so-called uterine inertia mentioned by Dr. Alden, in my opinion, should do better with infinitely less risk if given sufficient rest with an adequate dose of morphine.

It is in this first stage that pituitary extract is most dangerous resulting, occasionally, in a ruptured uterus and very frequently in severe laceration of the cervix with its resultant chain of disability and discomfort, most of which can be prevented by a little patience on the part of the obstetrician.

In going over the statistics of the maternity service of the Worcester City Hospital for the past ten years, I find we had approximately nine thousand admissions with no ruptured uteri resulting from the use of pituitary extract.

In uterine inertia of second-stage labor with the head well in the pelvis and no mechanical obstruction in the multipara, I believe the risk in the use of pituitary extract in small doses is much less than that of forceps, especially in home deliveries.

It is during and after the third stage that pituitary extract becomes an invaluable aid to the obstetrician. It is here in the arrest of hemorrhage that it has a most powerful action and oftentimes is a life-saving drug.

Briefly stated then, in the first stage of labor pituitary extract should rarely, if ever, be used. In the second stage frequently small doses are preferable to forceps. But let me remind you that the second stage means full dilatation of the cervix and not three or four fingers.

In the third stage and after, pituitary extract is the "friend in need" to the obstetrician and its dangers are practically nil except for the possibility, which Dr. Alden described, of shock. I have never seen such a case.

It is my belief that pituitary extract is given most frequently not because of any abnormality of labor but for the benefit of the attending doctor and in many cases he becomes a menace rather than a help to the patient in failing to follow the simple rules laid down by experience for the use of this invaluable drug.

CHAIRMAN PEMBERTON: The paper is now open for general discussion. If there is none, will Doctor Alden close the discussion?

DR. CARMI ALDEN: I have just one word to say, and that is that I was glad to hear that Doctor Jackson and Doctor O'Brien feel about it as I do. I was glad to hear both speak of the effect of pituitary extract only taking place if there is a certain amount of effacement in the cervix, that is, when it is being used for induction of labor. The other point was that I was glad to hear Doctor Jackson express his opinion as to the strength of standard pituitary extract. A standard ampoule contains 10 international units per cc., and why there should be any necessity for various extract strengths, so that one never knows what result will be attained when one orders .5 of cc., is more than I can understand; but so long as the situation exists it is necessary that we realize what the strength is in the particular ampoule we are using.

CHAIRMAN PEMBERTON: We have a short business meeting for the purpose of electing officers for the next year. We have the following report from the Nominating Committee: For Chairman, Joseph W. O'Connor, of Worcester; for Secretary, Thomas Almy, of Fall River. Are there any further nominations? What is your pleasure?

On motion, duly made and seconded, it was

Voted: To close nominations and the Secretary cast one ballot for the election of the officers nominated.

The Chairman announced that the Secretary had cast the ballot as instructed and that the gentlemen named were duly elected as officers of the Section for the ensuing year.

Adjourned.

NEW HAMPSHIRE MEDICAL SOCIETY

MALIGNANCY OF THE COLON*

BY CHESTER L. SMART, M.D.,† LACONIA

IF ten per cent of the total malignancy to which the human race is heir occurs in the large intestine, and if malignancy of the large intestine is more common than in any other part of the alimentary tract, the stomach excepted, and if the statistics of Hoffman are correct, that from 1920 to 1929 deaths from carcinoma of the colon increased in the United States 30 per cent and in England and in Wales 50 per cent during this same period, then a résumé of the subject of malignancy of the colon may be of value.

Carcinoma is the most common malignancy; sarcoma is comparatively rare. Malignancy may occur anywhere in the colon, but the most common sites and the percentages of occurrence are as follows:

Pelvic and sigmoid colon	55%
Cecum and ascending colon	22%
Hepatic flexure	4%
Transverse colon	7%
Splenic flexure	6%
Descending colon	6%

It will, therefore, be noted that more than half of the malignancies occur in the pelvic and sigmoid colon. It occurs in three males to one female.

Age: Carcinoma usually occurs in persons over forty-five years. The younger the patient, the more rapid is the growth. Sarcoma is usually found under thirty years.

Symptoms: It would seem from the symptoms presented in colon malignancies that they could be divided into two main groups.

1. Those occurring in the right side of the colon.
2. Those occurring in the left side of the colon.

In the first group the symptoms are rarely those of obstruction. The size of the colon, the liquid condition of its contents, also the nature of the growth, make obstruction rare. Rather do we see the symptoms of the so-called chronic appendix or gall-bladder, nausea, indigestion, gas pains and at times tenderness. These may be the only symptoms and it is this type of case on which one may operate for either of the above conditions and be surprised to find a well-advanced malignancy.

There are a certain number of cases with malignancy of the right colon that present the symptoms of severe anemia. The blood picture is that of a marked anemia, with weakness, loss of weight, and general malaise; and then there is the third type in which the tumor may be palpated. The patient may call your attention to the fact that he can feel a bunch in his right side. In this later type the diagnosis is easy and the element of surprise is not present at the time of operation. Loss of weight is much *more* common in cancer of the cecum than in other parts of the colon. Metastasis is much *less* in the cecum than in other parts of the colon.

To summarize, then, the symptoms of malignancy of the right colon are

1. Indigestion, simulating appendicitis or cholecystitis.
2. Anemia.
3. Loss of weight.
4. Tumefaction. Rarely are they obstructive.

Symptoms of malignancy of the left colon are

1. Diarrhea alternating with constipation. These occur fairly early.
2. Blood in the stools. More common on the left but does occur on both sides. It is probable that occult blood can be found in the stools approaching 100 per cent of early cases of malignancy.
3. Pus in the stools. (Also occurs on both sides but more often in the left.)
4. Symptoms of obstruction.

It is in the left colon that obstruction occurs as a rule. The fluid content has been absorbed in the right side and the fecal content is much more firm, also the growths are more of the type that invade the lumen of the gut. Whether the obstruction is partial or complete depends on the extent of the involvement of the lumen. The three diagnostic aids are

1. The well-lubricated index finger for rectal examination.
2. The direct visualization with the sigmoidoscope.
3. The barium enema with careful examination with the fluoroscope and x-ray.

Although many lesions can be detected by the barium meal, there are instances when barium by mouth would be distinctly contraindicated, especially in the obstructive type. In complete obstructions much aid can be obtained by a flat film of the abdomen, and even the exact location made.

*Read at the annual meeting of the New Hampshire Medical Society at Manchester, May 16, 1933.

†Smart—Surgeon, Laconia Hospital. For record and address of author see "This Week's Issue," page 1246.

The treatment of malignancy of the colon is primarily and essentially surgical, and here again, the treatment should, in these cases in which acute obstruction has not developed, be divided into three definite parts.

1. Preoperative care.
2. Operative procedure.
3. Postoperative treatment.

Under preoperative care, several days should be allowed to clean out the bowels, either by catharties, colonic irrigations, or, in case of intestinal obstruction, by a cecostomy and irrigation; to increase the fluid intake; and in cases of severe anemia, to do a transfusion. Such time used in preparation of the patient is, in many instances, life saving for the patient and sleep producing for the surgeon.

The operative procedure depends on the type and location of the lesion. When its location is known, the incision can be made where it will produce the best possible exposure. Examine in order and routinely the liver, aortic and pelvic glands, and finally the growth itself as to fixation and extent to contiguous organs. On the right side, because of the absence of obstruction as a rule, removal of the growth and anastomosis of the intestine can frequently be done in one operation, and when it can be so completed without undue danger to the patient has, of course, much to commend it. Malignancies of the left colon offer a different problem because of their obstructive nature. In most of the lesions I believe the multiple operation is the one of choice. If, after exploration, the findings justify resection, and if the growth can be brought out through the abdominal wall, according to the technique of Mikuliez, then the operation is less dangerous, and, although hospitalization is longer, the safety is so much greater, that it should be used more often than it is. In cases where the growth cannot be brought out through the abdominal wall, there should be, almost without exception, a preliminary cecostomy, and drainage for at least a week before the resection of the growth. In this type of case an end-to-end anastomosis should be done, and later the cecostomy wound may be closed under local anesthesia if nature does not close it spontaneously. The cecostomy allowing escape of intestinal contents and flatus relieves any undue strain on the suture line of the anastomosis.

In malignancy of the rectum and rectosigmoidal junction, removal of the growth and anastomosis have been, with me, unsatisfactory. It is difficult to do and recurrence is likely to occur, I believe, because, in order to avoid an artificial anus and do anastomosis, one is prone to remove less intestine and tissue than would be done in other locations. In this group of malignancies, then, I believe a permanent colostomy should be done, the distal end of the intestine dissected down to its peritoneal attachment, the peritoneum sewed over the stump, and the growth removed by the perineal route several days later when the patient has recovered from the first operation. A palliative colostomy should be done only in those cases which are obstructive and when metastasis has occurred, or where invasion of surrounding tissue makes the removal of the growth impractical or impossible.

The postoperative care used by Rankin in the Mayo Clinic for the first forty-eight hours can hardly be improved on. It is as follows:

1. Nothing by mouth.
2. No proctoclysis or enemas.
3. Hypodermoclysis of 2000 cc. of normal salt solution daily.
4. Intravenous dextrose solution in normal salt solution 1000 to 2000 cc. daily.
5. Morphine liberally.
6. Transfusion if necessary.
7. Chewing of gum and slices of lemon to prevent parotitis.

CASE HISTORIES

No. 1—L. Z.

This woman was admitted to the hospital November 28, 1929. She was forty-two years of age, overweight and a healthy looking woman. Her abdomen was definitely distended, especially over the colon. She was vomiting quantities of brownish material. Rectal and vaginal examinations were negative. A barium enema showed an obstruction at the rectosigmoidal junction.

A midline incision was made and an annular carcinoma found at this point. Apparently there was no metastasis to the liver or aortic nodules, and the growth was fairly movable.

A cecostomy was done and the wound closed.

Ten days later the abdomen was re-opened, the growth resected, and an anastomosis done by sewing the proximal end of the gut over a large tube, pushing the distal end of the tube out through the rectum, and anastomosing the gut, leaving the tube in place until it came away spontaneously several days later. A cigarette drain was carried down to the seat of the anastomosis.

The woman made a splendid recovery and was discharged from the hospital December 12, 1929. The cecostomy wound healed spontaneously. She went along perfectly well until July, 1932, when she began to develop pain in her lower abdomen, with symptoms of obstruction. An x-ray showed a partial obstruction at the seat of operation. She died in December, 1932, of a recurrence.

I believe in this case, that had a permanent colostomy been done on the left and the whole growth been removed by the perineal route at a separate later date, the patient might be alive today, but the desire to avoid an artificial anus on a woman of forty-two interfered with good surgical judgment and led me to do an anastomosis under very difficult circumstances, and although the result was apparently good in the beginning, it had a disastrous ending.

No. 2—A. F.

Admitted August 3, 1924, and discharged August 31, 1924. Symptoms began the previous April when she had a distressing ache in the abdomen, at times being very constipated, and then troubled with diarrhea. The past history was entirely negative.

The patient was sixty-three years old; normal weight 140 pounds, weight on admittance 126 pounds. Her nutrition was poor with considerable cachexia.

Her heart, lungs and urine were negative. She had a palpable, movable tumor in the region of the appendix, about the size of an orange, which was tender on pressure. She said she had noticed this bunch for six weeks.

She was operated on August 4. The whole ascending colon and four inches of the ileum were removed, and an anastomosis made between the ileum and transverse colon. There were some lymph nodes in the mesocolon.

Pathological report: The tissue received consisted of cecum, appendix, and about four inches of the small bowel. The cecum was much thickened and enlarged about one-half of its mesenteric surface. There was an enlarged lymph node in the mesentery. On section, the mass was found to consist almost entirely of columns of malignant epithelial growth, showing active mitosis and very little stroma. Lymph node on section showed areas of same growth. Diagnosis was cancer of the cecum, very malignant in type with metastasis to lymph nodes. Prognosis poor.

The patient made an uneventful recovery, went home in four weeks, and is alive and well today, nine years after the operation.

No. 3—M. E. A.

Female, aged 39, admitted August 19, 1931. For three years previous to entrance she had a distressed feeling over the pit of the stomach, becoming more severe three months ago, with attacks of severe pain sometimes localized in the right side.

She was a well-developed woman, color fair, heart and lungs negative. She was tender over the appendix, where a bunch could be felt, which was movable. There was no elevation of temperature. Her vaginal examination was entirely negative. A diagnosis of chronic appendix was made.

She was operated on August 20. A right rectus incision was made and an annular carcinoma partially obstructing the cecum about two inches above the ileocecal valve was found. There were glands in the mesocolon. About four inches of the ileum was resected and the whole of the ascending colon was removed. A lateral anastomosis was done between the ileum and transverse colon.

She remained in the hospital about twenty-three days and was discharged apparently well. The pathological report was carcinoma of the cecum with metastasis to the glands of the mesentery, with a poor prognosis. It has now been twenty-one months and the patient is gaining weight and looks well.

No. 4—F. B.

The final case I am reporting because of its comparative rarity and unusual features.

This boy was eight years old, had been operated on February 6, 1932, with a diagnosis of acute appendicitis, from which he made a good recovery. He was operated on again on April 13, 1932, when an exploratory laparotomy was done and a diagnosis of tubercular peritonitis was made. He was discharged May 8 much improved.

He came under Dr. Robinson's and my observation November 3, 1932, with his abdomen distended and with definite intestinal patterns appearing with each colicky pain. No palpable masses could be felt anywhere in the abdomen. A rectal examination was negative. A flat plate of the abdomen showed multiple fluid levels indicating intestinal obstruction. A barium enema showed obstruction at the splenic flexure.

Because of the location of the obstruction in the splenic flexure of the colon, an incision was made on the left side. The small intestine was greatly distended and dark. The large colon had a large tumor inside at the hepatic flexure, which was movable, and finally determined to be an intussusception. This was reduced by pushing a hard tumor mass up to the ileocecal valve. There were a few soft glands in the mesocolon. An incision was made on the right side about two inches long, and the growth was brought through the skin as per the technique of Mikulicz. About four inches of the cecum and three inches of the ileum were included in this loop. This was covered with vaseline gauze and left for nine days, during which time the boy took liquid nourishment, did not vomit and had normal bowel movements.

On November 12, 1932, the intestinal loop was removed with the actual cautery and a clamp applied in order to cut through the ileum and cecum, and thereby make a new anastomosis.

On January 14, 1933, under a local anesthetic the colostomy wound was closed, and the child was discharged January 29, apparently well and gaining rapidly in weight.

The pathological report says, "The tumor is grossly and microscopically typical of lymphosarcoma of the intestine. There is dense infiltration of the tissues by masses of anaplastic lymphocytes, a great many of which are in various stages of mitotic development. There was a delicate reticular network. This is a highly malignant tumor." (R. E. Miller, M.D.)

The report of the case is interesting, first, because it is the second lymphosarcoma near the ileocecal valve that I have had in the hospital in two years. Secondly, because he was operated on twice before for right-sided pain and a diagnosis had not been made of the tumor. Thirdly, because it showed an obstruction due to malignancy on the right side, which is unusual. Of course this obstruction was directly due to intussusception caused by the tumor near the ileocecal valve.

CONCLUSIONS

1. Carcinoma is increasing.
2. Symptoms are suggestive if a carefui history is taken.
3. In cancer of the left colon, obstruction is the rule.
   In cancer of the right colon, obstruction is the exception.
4. With the finger, sigmoidoscope, and barium enema, almost all cases can be diagnosed.
5. Surgery offers as large a percentage of cures as it does in cancer anywhere and radical removal of the growth and anastomosis should be done, unless metastasis or involvement of contiguous structures makes it impossible.

DISCUSSION

DR. EMERY L. FITCH, Claremont: Dr. Smart is to be congratulated for presenting a very important subject in a practical and interesting manner. There are a few points which perhaps will bear more emphasis.

The increased percentage of cancer of the colon is comparable with the increased percentage of cancer in other parts of the body. This percentage is arrived at by taking the number of deaths from cancer per one hundred thousand deaths from all causes. The death rate of cancer is apparently larger because the extensive prophylactic measures which have been carried out during the last few years toward the control of infectious disease have so lengthened the span of life that there has been created a greater available population to arrive at

the age which is prone to malignant disease. The movement now on foot to get a larger percentage of postmortem examinations in the State of New Hampshire will tend to show an increasing number of cancers of the intestinal tract, for there is no doubt that were it possible to get an autopsy on all our patients who die from abdominal disease, a great many concealed cancers would be discovered.

Another point which I should like to stress is the importance of making an x-ray examination of patients with gastric or intestinal symptoms.

Physicians and the laity alike must be educated to realize that cancer in the intestinal tract, as well as cancer of the breast and other forms of cancer, must be recognized early if a cure is to be accomplished. It must also be remembered that trivial symptoms of bowel change are important and if these trivial symptoms do not clear up promptly on treatment, the patient must be subjected to x-ray study, to thorough rectal examination, and to a laboratory test for the possible revelation of occult blood in the stools.

A comforting thing about carcinoma of the colon is that it seldom grows lengthwise of the bowel in its early development. It is always inclined to take a circular method of growth so that early carcinoma is nearly always annular in type and lends itself readily to surgical treatment by resection. Late carcinoma of the colon, like late carcinoma in any other part of the body, is surely a hopeless disease.

To illustrate the advantage of surgical treatment of carcinoma of the colon, I wish to report one case which shows a five-year cure.

Patient, Mr. W. F. W., was a clergyman, aged 54. He came to us on February 23, 1928, complaining of pain in the epigastric region, which had been recurrent for the past two years, being more acute within the last three months. Pain at the time I saw him was of a spasmodic nature and of short duration, but frequently recurring. About five months previous to our examination, he began having constipation with occasional diarrhea and during this time lost some twenty pounds in weight. At no time was blood detected in the stools. Before seeing us, he had an x-ray examination without positive diagnosis but at our examination showed symptoms bordering on obstruction.

The chief physical symptoms were rigidity of the right rectus with tenderness on pressure, especially in the right hypochondriac region, and general abdominal distention. He was operated upon on February 24, 1928.

We found a tumor of the hepatic flexure of the colon, about three inches long, which completely encircled the colon and was contracted down so that the bowel was almost completely obstructed. The cecum and ascending colon were distended, and the transverse colon was somewhat smaller than normal. A resection of the tumor was done, removing in all nine inches of colon including the hepatic flexure, taking three inches of healthy appearing bowel on either side of the growth and making a lateral anastomosis of the ascending colon to the transverse colon.

Pathological report from Dr. Kingsford was adenocarcinoma.

The man is now well, and his weight has increased from one hundred and twenty-eight to one hundred and seventy-four pounds.

He has no gastric symptoms whatever, no constipation and no diarrhea.

Recent x-ray plates show a normal emptying time of the bowel and barium enema carries to the ileocecal valve with no difficulty. I would like to show you three pictures which we took three months ago. This man went home from the hospital two weeks after the operation; I don't know for what reason; perhaps because he could stay in bed at home, but he was well enough to sit up, so we let him go home.

(X-ray pictures were shown.)

DR. CLIFTON S. ABBOTT, Laconia: After the fine presentation by Dr. Smart and the excellent discussion by Dr. Fitch, very little can be expected of me except, perhaps, a few remarks at random.

I want to compliment Dr. Smart on his paper; I don't have to do any more than that, because it stands for itself.

I understand that about fifty per cent of these cases are operable, that is, that you can do a resection and in the majority of these, some sort of anastomosis; to put it another way, in fifty per cent of the cases, it is only possible to do a palliative operation. In order to get better results, it is obvious that an early diagnosis must be made. Dr. Smart's diagnostic points were excellent; they were plain and simple, and, if followed, will succeed in bringing patients into the operating room a great deal earlier than in the past.

It should be remembered that these growths are slow, and have many remissions. The symptoms are notoriously inconspicuous.

There is another point that I would stress, and that is that we should guard against temporary therapeutic success. We should not dismiss a case with symptoms because of a negative x-ray until those symptoms are satisfactorily accounted for. If necessary, check by x-ray two or three times. The diagnosis in these cases has to be made from the whole picture. We cannot rely on any one thing.

Another important point is that the surgeon should be more willing to operate on suspicion. I have never known anyone to lose his or her life from a well-conducted exploratory operation. We all see a great many cases that come to the operating table too late. Many of these cases come to the hospital with an obstruction, and it is occasionally confusing to know whether we have a complete or a temporary obstruction, especially if the patient gives us the history of the same thing occurring several times and followed by relief. Dr. Haggard of Nashville gives the following rule: Obstipation for two or three days. Pain, vomiting and distention, not relieved by two stimulating enemas should be considered complete obstruction. There is danger in temporizing too long. When there is complete obstruction, the treatment is cecostomy, done preferably under local anesthesia. Do not explore. As Dr. Smart said there is a considerable operative mortality attached to these cases and this mortality comes to a great extent, from doing in one operation what should be done in two or three operations. It is generally agreed that a preliminary cecostomy or colostomy should be done. This gives an empty clean bowel to work with. If anyone doubts the value of this procedure I would refer him to Dr. Cheever's report from the Peter Bent Brigham Hospital of Boston, in which he records 35 cases with preliminary cecostomy, with a mortality of 8.5 per cent and 50 cases without a previous cecostomy or colostomy, with a mortality of 24 per cent. The principles that have to be observed in all anastomoses are the securing of an adequate blood supply and the institution of measures to relieve pressure on the suture line. If a preliminary cecostomy or colostomy has not been done, a tube should be put into the bowel proximal to the suture line.

In respect to the type of anastomosis. The condition and situation of the growth, whether there are complications, and the preference and experience of the operator usually determine whether an end-to-

end, end-to-side, side-to-side or Mikulicz procedure will best serve the occasion. It is unfortunate that we have to do so many permanent colostomies and here my experience probably coincides with all of yours, that the one of choice is the low left through a muscle splitting incision. A colostomy of the transverse colon gives trouble through liquid feces.

In inoperable cancer of the rectum, after a colostomy I have seen radium implants give relief from pain, bleeding and discharge. Occasionally one gets better results than he expects. I have a patient treated six years ago, clinically free from her trouble today.

DR. GEORGE S. FOSTER, Manchester: There is one phase of this colonic malignancy that I believe is worth rather serious consideration, namely, the patient with an inoperable carcinoma, the patient who has a tumor or growth which cannot be removed by any form of surgical interference.

I believe in these cases that a great deal can be done toward life extension, and also we can secure a great deal of comfort and freedom from pain for these unfortunate individuals.

Take, for instance, cases of carcinoma of the colon where it is not advisable to operate; a false anus will oftentimes give to these individuals a life extension of several years with comparative comfort and freedom from pain. These patients enjoy themselves, and they really get along very nicely.

Then, there is that type of case that perhaps involves the sigmoid, inoperable because of its size or because it is so deeply embedded. Perhaps it has already metastasized to the liver or extended into the lymphatics. I believe in this type of case, the ileum can be implanted into the rectum or perhaps a side-to-side anastomosis, this giving life extension and comfort with freedom from pain that will make this procedure worth while.

It would also appear that we must not forget that in these low-grade malignancies, especially those about the mid area of the rectum, that irradiation in one form or another has done a great deal of good. I believe such a method of treatment will continue to assist the patient to live on a few years, and possibly in some instances will fortify the patient and assist him to go on for a long time free from pain and in a comfortable condition.

I believe that these procedures in inoperable cases are well worth while. I would again congratulate Dr. Smart on his very excellent paper.

DR. PHILIP H. GREELEY, Portsmouth: There is a phase of this subject, so ably discussed, which involves both curative and preventive medicine. Every cancer of the colon is preceded by irritation that comes from infection and inflammation of long standing. This chronic inflammation is an extremely common condition and furnishes foci of infection which in comparison with other chronically infected areas, like teeth and tonsils, make the latter look like a drop in the bucket.

Mucous colitis is the cause of nervousness not the result as some writers on the subject of medicine have taught. It is due to infection just as much as the mucous discharges from nasal infection.

The time is not far off when an examination of a patient who is chronically ill, whose trouble cannot be laid to tuberculosis or syphilis, will include an examination of the colon. This examination will consist not only of x-rays but what is more important, an examination of its contents. This will give the patient a much fairer deal and will prevent the mistake of sending him away with the report that he is perfectly well, which is only another way of sending him to some of the various medical trailers.

When discovered and treated early it will prevent not only many cancers but various other ailments which arise from a focus of infection. If we could only find a way to prevent this infection, our efforts would be of great service to humanity.

DR. GEORGE C. WILKINS, Manchester: Dr. Smart's paper was an excellent presentation of the subject. I enjoyed it very much indeed. I take exception to only one point in which he said that these cases could be operated upon as successfully as cancer in other parts of the body. They could be, but are not, for the reason that we do not get the cases early enough.

I took the trouble to look up a series of cases at the Elliot Hospital for the past ten years, and it surprised me, as well as being most interesting, to find during that time there were only twenty-six cases of carcinoma of the colon, and of this number of cases, the mortality rate was very high. The reason for this was that in almost every case, the patient had developed obstruction of greater or lesser degree before being sent to the hospital. That complicates the cure of the patient very much indeed. These cases corresponded to the location incidence that Dr. Smart presented, with the exception of the cecum, and there we had only two cases and the mortality after operation was fifty per cent. We had two cases of ascending colon cancer with a mortality of fifty per cent. We had five cases in the transverse colon with a mortality rate of sixty per cent. We had six cases of the descending colon with a mortality rate of fifty per cent. We had eleven cases of carcinoma of the sigmoid, all of whom were operated upon with a mortality rate of thirty-six per cent.

The recovery of these cases after operation depends almost entirely upon how early we get them.

Another point that Dr. Smart mentioned was the symptom of alternating diarrhea and constipation in carcinoma of the colon. That is a late symptom. The symptom that should be looked for is one which should lead anyone to suspect the possibility of carcinoma of the colon, and that is a gradually increasing constipation. The patient who has never taken a cathartic and is obliged to take a little and then a little more, or the patient who has taken a mild cathartic for years and within a month or two is obliged to take more and more should be examined at once.

I was very glad to hear Dr. Smart mention the method of diagnosis, first, the finger, secondly, the sigmoidoscope, and thirdly, the barium enema.

In regard to radium, I believe that it is impossible to implant radium in the abdomen in such amounts that it will do any good without doing serious injury to the patient, and I think that any form of palliative radiation in carcinoma of the colon is almost worthless. Some good effect can be obtained from x-ray, but very little can be expected in the way of real accomplishment from radium or x-ray.

The treatment of carcinoma of the colon is always operative, and more cases will be saved if a preliminary colostomy is performed on any case that has the slightest bit of obstruction.

LATEST DEVELOPMENTS OF THE TONSIL PROBLEM*

BY ADOLPHE J. PROVOST, M.D.,† MANCHESTER

ABOUT ten months ago, an editorial in our local evening newspaper commented on the possibility of Manchester becoming a tonsilless community, if the hecatomb of tonsil and adenoid cases were kept up at the rate they were being done at our County Hospital. The next day a prominent physician of our city volunteered his impression that too many tonsil and adenoid operations were done in this country, and he predicted that, within ten years, wholesale tonsillectomies and adenoidectomies would probably be a thing of the past. These two incidents, plus the fact that a good portion of the above cases came under our personal surgical supervision, gave us the incentive to look into this problem and find out whether too many were operated, and whether the profession is justified in pursuing the same course.

We are endeavoring to offer this subject in such a way as to be of the greatest benefit to the general practitioner. Our intention is not to present something original, but rather to bring to you a useful review of the status of the tonsil and adenoid problem in the light of various findings of the past few years.

The anatomy will not be discussed. The methods of surgical treatment will also be overlooked, because we may assume safely the relegation of tonsillotomy to ancient tonsillar history, and the general acceptance of tonsillectomy.

We hear often the following comments: "Is the tonsil an organ?" "It must have a function, if our Creator allowed it to be developed there." A structure in our general bodily system cannot be considered an organ, unless a definite function can be attributed to it.

We look upon the function of the lymphatic system as that of drainage. Even though the tonsil resembles the lymphoid nodule in the appearance of the characteristic cells and the type of reticular tissue of the stroma, it is unlike the lymph node in that it remains open to the throat and is apparently a culdesac with an epithelial lining of its surface. It may complete, with the adenoids and lingual tonsils, what is called Waldeyer's ring, the physiology of which is unknown. The only way in which the palatine tonsil differs from the other two structures, is in the fact that it is more compact, partially encapsulated and submerged, hence more prone to infection.

The multiplicity of fanciful theories is enough proof that the physiology of the tonsil is far from an established fact. Some claim they are "absorbent glands", belonging to the digestive tract, with the function of reabsorbing the saliva during the intervals of the meals; or "secretory glands", helping to moisten the food and to facilitate deglutition; or "embryonic remains", as they are known to be well developed before birth and that they tend to atrophy in the first years of life, and it is assumed that they must have a function during that time; or "eliminating organs" of various endogenous toxins during an acute infectious disease; or "internal secretory organs" having an action similar to that of the adrenals in the elevation of the blood-pressure. (Masini.)

To offset the above unusual theories, we find the hematopoietic and protection theories more serious. The former claims that the lymphoid masses of the tonsil are cytogenetic or cell-bearing, making them active blood-forming organs. That lymphocytes are produced in their germinal centers, rests on a constant histological finding. Furthermore, Stöhr has demonstrated that leukocytes can migrate from the lymphoid tissue of the tonsil into the crypts, thence into the pharynx where they destroy microörganisms.

Finally, the protection theory offers the idea that the tonsil acts as a filter in the lymphatic system with which it is connected. A variation of this is the theory of immunity, wherein the tonsil is assumed to act as a culture tube, receiving germs from the mouth and discharging them as a vaccination to the body. The difficulty is that on becoming surcharged, the culturing faculties break down and the process is reversed, the tonsil expelling infectious germs into the system. If this assumption of autovaccination is correct, those who have infected tonsils ought to be healthier than those without, whereas they are improved in health after the tonsils are removed.

This rapid review of the prevailing theories shows the magnitude of the problem to the research workers of ascribing a definite physiological function to the tonsil. However, relatively recent findings along bacteriological lines are more illuminating.

Bacteriological studies of the so-called normal tonsils usually reveal 90 per cent of streptococci, of which 50-78 per cent are of the hemolytic type. Other prevailing organisms are micrococcus catarrhalis, staphylococcus aureus, pneumococcus, diphtheroids, etc. With this in mind, when we consider that large series of morbidity experiences or statistics make it increasingly evident that five to ten per cent of all infections in certain localities are due to tonsillitis

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and other throat disorders, that 15 to 20 per cent of the respiratory illnesses are due to infection from diseased tonsils, and that among the local foci associated with arthritis, tonsils are second only to infected teeth, we may well realize the importance of the tonsils materially, physically and economically.

In 1924, Nakamura reported the results of a bacteriological study, during a period of one year, of 2048 tonsils removed at the Mayo Clinic, on account of recurring attacks of tonsillitis, or, more often, because they were believed to be foci of infection in patients suffering from ulcers of the stomach, chronic infectious arthritis, myositis, cholecystitis, nephritis, etc. Of the group of 1250 tonsils, 52 per cent revealed hemolytic streptococcus, 58 per cent streptococcus viridans, and 18 per cent indifferent streptococci alone or with other types. The virulence of these streptococci was of a relatively low order. In 841 tonsils, microörganisms other than streptococci were also studied. Staphylococci were found frequently in large numbers, usually hemolytic. A relative increase in the number of hemolytic streptococci occurred in December and persisted throughout the winter months. Further studies of the bacterial flora in the throat following tonsillectomy, gave evidence of a great reduction not only in the presence of hemolytic streptococci, but also in the numbers of the other types of organisms.

To quote Birkhaug: "The ill effects of diseased tonsils, especially those infected with streptococcus hemolyticus, form a large bulk of the common infections of childhood and respiratory illnesses in the adult. The various forms of acute tonsillitis and allied throat infections are invariably attributable to the pathogenic action of hemolytic streptococci. It is significant that from a bacteriological point of view, these organisms are indistinguishable from hemolytic streptococci isolated with regularity from the tonsillar crypts in scarlet fever patients. . . . It is quite apparent that their occasional presence in diseased tonsillar tissue favors the possibility of focal infection. From this source are discharged into the blood stream not only bacteria, but also their autolysates and soluble toxins by which the body is rendered hypersensitive to subsequent disorders."

With the question of the physiology of the tonsil still undecided, but supplemented by definite bacteriological findings, some might advocate tonsillectomy as a matter of prophylaxis. However, we should not be led to this extreme, but to have recourse to operation only in the face of real, clear-cut indications. The latter seem rather well covered by the following:

1. Recurring tonsillitis or peritonsillitis.
2. Interference with respiration.
3. Chronic enlargement of the cervical glands situated near the angle of the jaw.
4. Proof that the tonsils are carriers of diphtheria.
5. Recurring joint symptoms following attacks of acute and subacute tonsillitis.
6. Chronic lacunar tonsillitis, which, after careful consideration, is regarded as the focus of infection in certain systemic conditions.

In order to clarify the last indication, it seems well to give a résumé of some of these diseases.

a. Alimentary diseases; gastro-intestinal dyspepsia associated with the toxemia of chronic tonsillitis; gastric or duodenal ulcer.

b. Infectious diseases: scarlet fever and diphtheria.

c. Glandular diseases: cervical adenitis, and toxic goitre.

d. Rheumatic diseases: fibrositis, bursitis, periostitis, osteomyelitis, myositis and neuritis.

Arthritic diseases: acute rheumatic fever, subacute or chronic rheumatic arthritis, and rheumatoid arthritis.

e. Respiratory diseases: bronchitis, bronchiectasis, pulmonary gangrene, tuberculosis.

f. Cardiovascular diseases.

g. Acute or chronic glomerular nephritis.

h. Nervous diseases: chorea.

i. Skin diseases: herpes, erythema multiforme, chronic urticaria.

j. Iritis and associated diseases of the uveal tract.

k. Aural diseases: chronic tubal catarrh, labyrinthitis.

In the last eight or ten years, we have been favored by many far-reaching researches on the tonsil problem. The subject was covered from every angle, and the results obtained have done much to give us a clearer understanding of the status of the tonsils in relation to the above-mentioned diseases.

Probably the most comprehensive study has been that of Kaiser, who directed a survey of 48,000 school children, of whom 20,000 were tonsillectomized. His first reports made the tonsil a real factor in the causation of rheumatism, scarlet fever and chronic heart disease, whereas the tonsillectomized children had a greater protection against them. Again, he studied 439 rheumatic children with the following findings:

1. The most susceptible age for the first attack of rheumatic fever was between 8 and 14.
2. Nearly twice as many cases had a first attack when the tonsils were present.
3. Recurrence was 10 per cent less in children who had tonsil and adenoid operation after the first attack than in those who remained unoperated.
4. Carditis and chorea were found as often whether tonsillectomy was done or not done after the first attack, but the association of carditis with chorea was less in tonsillectomized children.
5. Tonsil and adenoid operation was advocated in the rheumatic and potentially rheumatic until more is known about the etiology of rheumatism.

Later, after studying 2,200 tonsillectomized children over a period of three to ten years, Kaiser concluded that:

1. Late results are evident only in the reduction of sore throat, cervical adenitis, otitis media, scarlet fever, diphtheria, rheumatic fever and heart disease.

2. Respiratory infections such as laryngitis, bronchitis and pneumonia are not benefited, but occur more frequently in tonsillectomized children.

3. Incomplete tonsillectomies do not protect against throat troubles.

Recently Kaiser again reported the results of a study of 4,400 children, and he found one per cent of chorea among tonsillectomized cases as against 0.6 per cent in the non-tonsillectomized. Hence, chorea does not seem an indication for removal of healthy tonsils and adenoids.

Findlay and his co-workers found that preliminary tonsillectomy may render a person less susceptible to rheumatic arthritis, but not to chorea. Such an operation or one done in the early stage of infection may, in arthritis, render the heart less liable to be attacked, but not so in chorea. As carditis usually occurs during the first and second attacks of rheumatism, tonsil and adenoid operation should be done before the second attack.

Wilson and his associates studied the relation of tonsillectomy to prevention of rheumatic heart disease in 413 rheumatic children, over a period of one to ten years, 247 of whom were subjected to tonsil and adenoid operation. "Manifestations of infection recurred in 47.7 per cent and appeared for the first time in 34.7 per cent of the treated children. In only 17.5 per cent was there no manifestation of rheumatism after the operation. In rheumatic children less than nine and ten years of age, recurrent attacks were frequent, whether or not tonsillectomy had been performed. In older children recurrent attacks became less frequent regardless of enucleation of tonsils. The age at which tonsillectomy was performed, and not the fact of tonsillectomy, appeared to be the significant factor in the incidence of non-recurrence of infection after operation."

Robey and Finland claim that tonsillectomy can be done during the acute stage of rheumatic fever without harm to the patient. Ether was used in most of the 165 cases reported, and these operations were all decided upon by internists. The only complication delaying this procedure was a bronchitis or bronchopneumonia. Cardiac conditions practically never contraindicated it except in extreme cases. Later, Robey again advised it, "when the usual purely medical measures have failed. The operation even in the presence of fever and inflamed joints, is not more dangerous than interval tonsillectomies. It should not be done while active tonsillitis is present, but this question should seldom arise, since acute rheumatism is usually a sequel of acute tonsillitis."

Monroe and Volk studied the effect of tonsillectomies on about 1,500 children of whom 736 were tonsillectomized. The survey covered the complaints of sore throat, coryza, mouth breathing, malnutrition, and cervical adenitis; 91 per cent of the tonsillectomized cases were relieved. Improvement occurred in 40 per cent of cases with subnormal mentality, showing retarded progress in school due to enlarged tonsils and adenoids. The non-tonsillectomized group went unrelieved.

Kikowsky observed 1,013 scarlet fever cases, of whom only 23 were tonsillectomized. Many untonsillectomized developed serious complications. In the above 23, the attacks were milder and showed fewer complications. He believed that the tonsils may be an important factor in scarlet fever, as they may be the depository of the scarlet fever virus and probably its port of entry.

On the subject of acute cervical adenitis in children, Baum reported a series of 40 selected private cases, the average age of whom was 3.6 years. They were treated contrary to all the conservative methods, because tonsillectomy was done during the acute stage of the disease. To quote Baum, all these cases showed "acute enlargement of the anterior cervical glands following a tonsillopharyngeal infection, with soreness and tenderness of the glands, stiffness of the neck, high and usually irregular fever, an increase in leukocytes and in percentage of polymorphonuclear neutrophiles and a decrease of hemoglobin. . . . When tonsillectomy is available as a form of treatment, it should be resorted to as early as possible after it is seen that the case is not progressing satisfactorily without it. . . . It may be accepted as a fact, that the time the glands assume the proportions of an unmistakable acute adenitis, the throat has subsided from its preceding acute stage and it is safe to operate. This statement is made in the full knowledge that these cases are practically always due to streptococcus hemolyticus. . . . From twenty-four hours to three days from the time of operation is the usual period required for subsidence of both glands and temperature, and the average time for the series was 3.2 days."

Discussing Baum's assertions on this subject, Defnet agreed heartily with him that, "particularly in cases of adenitis following scarlet fever and in cases developing hemorrhagic nephritis, early surgical intervention should be instituted." Hays also agreed that operation should be done regardless of fever or how severely ill the child is, and he stressed the point of removing the tonsils and adenoids at the time a mastoid operation is performed, particularly in those cases with enlarged cervical glands.

So far we have brought to you results obtained in children. What can we expect to obtain from tonsillectomy in adults? Farnum re-

ported its effect on existing cardiac diseases. Five hundred and twenty-six cases were followed over a period varying up to nine years. All had evidences of endocarditis, due to acute rheumatic polyarthritis, chorea, repeated acute tonsillitis, and 62 had positive Wassermann reactions. Tonsillectomy hardly arrested such diseases, and he concluded that, in operation as a definite therapeutic measure in cardiac disease, the best results will be obtained before incidence of heart infection or early in its course.

Pavey-Smith performed tonsillectomies in 200 cases of subacute rheumatism, infective arthritis, fibrositis, osteoarthritis, neuritis and sciatica. He found that the younger the patient and the shorter the duration of the disease, the better the prospects of good results. In subacute rheumatism results were so good that tonsillectomy should become a routine, if only as a prophylaxis against recurrences and later endocarditis. In chronic focal arthritis, if the evidence condemns the tonsils and they are completely excised, improvement may be expected in 80 per cent of the cases.

Bruns, treating the matter, as an internist, advised tonsillectomy, only in cases in which a relation to secondary disorders can be proved. He considered it inadvisable to operate for relief of chronic nephritis.

Jones cleared up with tonsillectomy 13 cases of albuminuria, where the cause could be ascribed to focal infection. Later, he reported 17 cases of acute nephritis with acute tonsillitis improved by the same procedure. He referred to Adler, who made the statement that nephritis occurs in 75 per cent of cases of pure tonsillitis. Jones came to about the same conclusions by means of routine tests. He advocates a pharyngeal examination in cases of albuminuria of doubtful origin.

Braasch and Cathcart stated that the tonsils should be examined routinely in chronic pyelonephritis.

In allergy, Rackemann and Tobey examined 1,074 cases of bronchial asthma, and found that the tonsils have a very negligible bearing on the outcome of the disease. Bullen claimed that tonsillectomy and adenoidectomy do not improve nasal or pulmonary manifestations of allergy. Furthermore he found that in 1,000 tonsillectomies done between the ages of five and six, there were a slightly greater number of hay fever cases.

As this paper is not for the otolaryngologist in particular, we shall refrain from discussing the beneficial effect of tonsillectomy in recurring iritis, labyrinthitis, chronic catarrhal conditions of the ear, where foci of infection have to be ruled out.

CONCLUSIONS: Having gone over the results of these many studies on the tonsil problem, we are impressed by the persisting uncertainty of its physiology, and by the concrete bacteriological findings. Clinically, we have shown the conditions where much can be expected from tonsillectomy, where only slight improvement is possible, and where the operation is not worth a trial. Finally we feel that, in order to avoid doing too many operations, we must always bear in mind that they should be attempted only in the presence of clear and definite indications.

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DISCUSSION

DR. FRANKLIN N. ROGERS, Manchester: This symposium of modern thought and opinion in relation to the tonsils is of great value to us all. Dr. Provost's paper points out clearly that the approach to the tonsil question is along conservative channels guided by the results of much research. In his excellent presentation of the subject, Dr. Provost lists numerous indications for tonsil removal. I am sorry there isn't time to stress them more specifically. However, they should be kept in mind by all physicians when considering tonsil problems whether they operate or not.

The question is, to operate or not to operate; and the answer involves one of the fine arts in medicine, which is that of obtaining a clear history of the case in relation to the tonsils. For instance, we might ask, how often does the child have sore throat? How long do the attacks last? Has he had scarlet fever? Is he a mouth breather? Does he complain of earache? Is he anemic? Is he losing weight? All these things and many more should be gained in the history taking. Upon inspection of the tonsils, we may ask these questions. Are the tonsils hypertrophied or inflamed, or are they small and embedded? Does the tonsil appear to drain well? Has it apparently fully recovered from a previous infection? Do tonsillar glands persist? All of these things have a bearing on whether the tonsils should be removed.

Then there is the time of year to consider. Tonsils should be removed at a time best suited to the general health of the child. Late spring and summer seem to be the safest period, as no epidemic infection is usually about, and the general health of the child is better at this time.

Parents should understand that the removal of tonsils is a major operation. Children should not be operated upon for the removal of tonsils and adenoids and left with unskilled attendants. About one in ten operations is followed by delayed hemorrhage of more or less severity. Parents are apt to put off needed throat operations on young children, feeling that they will not get their growth if operated upon before six years of age. The public should be taught that children's tonsils should be removed when a competent physician advises their removal. There is no age limit. I have removed adenoid tissue from several babies under three weeks of age to allow free nursing, in spite of the objection of the parents' relatives. These operations

were always followed by great benefit to the patients. Parents should also be taught that removal of the tonsils and adenoids will not prevent colds or make a child bright in school. Some of the brightest children I have seen needed tonsil operations. Some children have worse colds after tonsils and adenoids have been removed. Instead of tonsillitis, they develop bronchitis whenever throat infections set in. The removal of tonsils does not seem to affect directly a child's immunity to colds.

I have always held that the tonsils and adenoid body acted as shock absorbers against the invasion of disease; or a first line of defense, so to speak. I also feel that they were put there for a purpose, and should be let alone so long as they remain correct in their behavior and keep awake on the job of protecting the individual, but should be removed after having had a fair trial and found guilty of blocking the traffic, or poisoning the system.

DR. DANIEL C. NORTON, Manchester: Dr. Provost's review of the tonsil problem has covered every phase of the subject. I can only emphasize the clinical conditions from infancy to old age in which a tonsillectomy will benefit the patient.

Retropharyngeal abscess in the first or second year is a condition analogous to a quinsy in an adult and should be followed by a tonsillectomy.

Adenitis, where the glands and temperature persist into three or four weeks, needs a tonsillectomy. A delay in operating after an adenitis subsides is time wasted.

Recurring attacks of tonsillitis demand operation to prevent the serious complications which may follow. Recurring head colds that appear without any apparent reason are usually stopped by a tonsillectomy.

Acute hemorrhagic nephritis always demands a careful inspection of the tonsils.

In the matter of chorea, the statistics give about a fifty-fifty chance of cure by removal of tonsils, but in my experience, there have been so many rapid cures that I nearly always advise operation.

Osteomyelitis cases that do not clear up quickly are almost universally benefited by the removal of the tonsils. I recently operated upon a young man who was allowed to have three attacks of osteomyelitis before the badly diseased tonsils were removed.

A history of quinsy sore throat demands tonsillectomy without examination, as the tonsils are always diseased.

In many gastro-intestinal cases, the cause of the trouble is at the top of the pipe. Personally, I would not let a friend of mine submit to a gastro-enterostomy without first having the teeth x-rayed and the tonsils examined.

Skin conditions, such as acne, psoriasis and erythema are benefited by tonsillectomy. I know one dermatologist in Boston who will not treat acne until the tonsils are removed.

In arthritic conditions, it is wise to remove the tonsils. Here, may I emphasize what Dr. Provost has said that the tonsils should be removed before the second attack, as the heart complications usually follow the second acute attack.

In a primipara showing albumin early, and increasing, I have removed tonsils in the sixth and seventh months without upsetting the patient and with a decrease in the albumin where an eclampsia was to be expected.

DR. REGINALD FITZ, Boston: As I listened to Dr. Provost's paper and the discussions which followed it, I have been very much impressed by the note of conservatism that has been put forth. Dr. Provost has not overstated any of the known facts in regard to the effects of tonsillectomy and both discussers have agreed in general with his viewpoint. I liked what Dr. Rogers had to say with regard to tonsillectomy and recurrent colds. Parents, particularly, should be educated to realize that the removal of tonsils in childhood will not necessarily protect against subsequent, acute upper respiratory infections, nor will this operation in all cases protect the patient with rheumatic fever from subsequent attacks of rheumatism or endocarditis.

Tonsillectomy, too, has certain disadvantages. Occasionally lung abscess develops after the operation and I think most of us agree that the type of throat infection which tonsillectomized people may develop is likely to be unusually serious. Dr. Provost has taken a very sensible stand which we should all remember. In a given case tonsillectomy should be performed by a competent nose and throat man only when a competent physician believes operation is indicated. Nowadays no good nose and throat man and no good physician believes that the removal of the tonsils is so miraculous an operation as it was thought to be a few years ago.

MISCELLANY

NEW MEMBERS

Harvey W. Bennert, M.D., Goffstown. University of Colorado 1932. Licensed 1933.

Paul R. Hamel, M.D., 1061 Elm Street, Manchester. Boston University School of Medicine 1932. Licensed 1933.

Morton J. Robbins, M.D., 225 Main Street, Nashua. State University of Liege, Belgium, 1927. Licensed 1930.

RECENT DEATHS

MacMURPHY — NELSON W. MACMURPHY, M.D., of Belmont, died at his home, November 23, after a brief illness.

GRANT—ALBERT E. GRANT, M.D., of Durham, died suddenly at his home, December 8.

VERMONT STATE MEDICAL SOCIETY

THE MANAGEMENT OF CONGESTIVE CARDIAC FAILURE*

BY C. H. BEECHER, M.D.†

THE conception of cardiac failure has come to be one of impairment of function. The definitions of Mackenzie and of Lewis cover well that understanding of the disorder.

Mackenzie's: "Heart failure is simply inability of the heart muscle to maintain the circulation, due to too great strain being put upon it."

Lewis': "Heart failure develops because the capacity of the heart for work has decreased."

But the corollary of these "heart failure is deferred or recovered from when the labor the heart has to do is reduced to its capacity for work" has not been so thoroughly appreciated, and its application to treatment is still too vague.

The symptoms and signs are mainly those of venous stasis, only a few are due to arterial anemia. The symptoms are shortness of breath, at first on exertion, finally reaching the stage of breathlessness even when sitting quietly. The rate of respiration is usually increased. Weakness and giddiness may be present. Fullness of the head to actual ache is frequent. Precordial distress to actual pain is occasionally a feature. Cough is present, late. All of these contribute to cause restlessness, anxiety, and sleeplessness.

The *signs* in order of importance are as follows:

1. Overfilling of the veins, especially the cervical.
2. Enlargement and tenderness of the liver.
3. Moist râles at the bases of the lungs.
4. Concentrated and scanty urine.
5. Cyanosis.
6. Edema, dependent, and hydrostatic.
7. Malnutrition.
8. A variety of murmurs and altered rhythms.

MANAGEMENT

Rest: The most important of the measures to correct failure is relative rest of the heart. Too frequently cases are seen in which everything else has been done except to secure rest for the heart by keeping the patient quiet.

Normally the pulse averages 66 while lying down, 70 sitting, 80 standing and from 100 to 170 or more on exercising. This means an increase in work of the heart of six per cent while sitting, 20 per cent while standing, and 50 per cent to 150 per cent on exercise over what the heart has to do while lying down and emphasizes the need of quiet and its value.

Fortunately edema is least harmful in the feet and legs so that the sitting posture, in which patients have least dyspnea and most comfort, is allowable, but only if unable to lie down. Anyway, remove their shoes and clothes. In the severer cases no exertion of any kind may be allowed.

It is frequently necessary to enforce rest with sedatives. Often there is more cardiac quiet secured by sedatives than by any other medication. On this basis an opiate is one of the most valuable of cardiac drugs. To avoid the unpleasant effects of morphin, codein is used hypodermically in full doses at regular intervals; usually ½ to one grain every four hours, and only if necessary are small doses of morphin added. Later it may be gradually dropped. Cases of codein habit are nearly if not quite unknown. Other hypnotics may be used, if for any reason codein is contraindicated. Whatever is used must be sufficient to produce rest and sleep.

Diet: The diet must be bland, not bulky, and easily digested. It need not be sufficient in caloric value for maintenance for the first few days. Later it should be at least a maintenance diet. Rarely will Karell's diet of 800 cc. of milk in 24 hours and nothing else, not even other fluids, be satisfactory. Occasionally a patient will take it for a couple of days with benefit. The amount of fluids including that given as food should be restricted to 1000 cc. for the early days of treatment. Frequently a diet poor in salt or even salt-free is useful in the treatment of edema.

Venesection: To relieve the heart of work this need not be done except there be *marked* venous stasis. Then it may be repeated if the results warrant. Eight to sixteen ounces is the usual amount.

Oxygen: This may be useful in decreasing breathlessness, and so decreasing the demands on the heart. If used it must be in sufficient concentration, 40 per cent, to be of value.

Respirator: There have been recently reports of the use of the respirator to help relieve the dyspnea.

Paracentesis: This should be employed early rather than late, when the serous cavities contain fluid.

Southey's tubes and *Incisions:* These need rarely to be used.

*Paper read before the Vermont State Medical Society, October 5, 1933, at Barre, Vermont.

†Beecher — Professor of Medicine, University of Vermont. For record and address of author see "This Week's Issue," page 1246.

Thyroidectomy: This operation may be necessary in the thyrotoxic cardiac failures, the usual preparation and precautions being observed.

Laxatives: Early, free watery evacuations are desirable. Afterward the movements should be restricted to one or at most two loose movements a day. More may do harm rather than good by the physical exertion necessary and by interfering with rest.

Diuretics: Other than digitalis: These may be occasionally necessary in persistent edema. Theobromine sodium salicylate (diuretin) by mouth in konseals; and Salyrgan or Novasurol ½ to 1 cc. of a 10 per cent sol. intravenously once a day for two or three days are the choices. The mercurials are best preceded for a couple of days by administration by mouth of ten grain doses of ammonium chlorid if the stomach will stand it.

An associated condition may need treatment, in fact may be the deciding factor after digitalization, e.g., iron in anemia, mercury, iodides and arsenicals in syphilis.

Digitalis: This the safest and most reliable of the drugs used in cardiac failure and must be used intelligently. Someone has happily referred to it as a "cardiac hypnotic". This seems a much better designation than a tonic or stimulant, since we know that it is toxic, and since it better describes the effect we want on the heart, viz., rest. Digitalis is of value largely because it enforces rest of the heart. It affects the heart in three ways:

1. It depresses the pace-making functions of the S. A. and A. V. nodes largely through vagal stimulation and so induces slowing of the rate and relative rest.

2. It decreases conductivity all through the heart muscle but especially through the main conducting path between the auricles and ventricles, inducing blocking of the impulses and so reducing the ventricular rate, with relative rest. The rate may in some cases be made to fall 50 to 100 beats per minute, an elimination of 72,000 to 144,000 beats per day. Some rest!

3. The cardiac tone and the completeness of contraction are increased, the relative rest resulting in an application of the principle of the "all or none" theory of muscular contraction, viz., on stimulation a muscle responds, if capable of contraction, with all the power it then has. And by the way, digitalis adds nothing to the power of the heart muscle but does enable it to use to better advantage what power it has.

Only rarely will its administration be necessary by other than the oral route.

Probably one reason why in so many cases digitalis is not given in sufficient dosage is that the symbol *m* is read drop, when as a matter of fact unless a special *m* dropper or a graduate is used, the drop is only 1/3 to 1/2 of the *m*. It is one of the reasons why some have better results with the pills or tablets than with the tincture, which are the two preparations for oral administration. They must be physiologically active at the time of administration.

Either may be given in capsule to cover the taste.

The tincture, unless in capsules filled at time of administration, may well be given in a small amount of ice-water after food.

Rectal administration is at times a useful route. The tincture may be diluted to not more than three ounces with warm normal salt solution and introduced slowly through a small catheter. Rectal suppositories often can be used to advantage. The dosage by rectum should be about the same as by mouth.

Hypodermic administration should be reserved, in the few instances where necessary, to the use of the substitute, strophanthin, intravenously. It should be used only *before* digitalis has been used, not after, in doses of not more than 1/100 gr. every 12 hours.

Dosage of digitalis must be sufficient to produce its effect, digitalization. The action of digitalis on the heart is by vagal stimulation; by decreasing conductivity; and increasing tonicity and contractility, and results clinically in (1) *slowing of the ventricular rate,* (2) *diuresis* and (3) *the relief of symptoms and the disappearance of the signs.* It is unfortunate that the methods of standardization of the strength of the drug have resulted in the use of the terms in dosage. I refer to the practice only to condemn it. It is to be remembered that any given dosage should be used *only* as a *guide* to securing digitalis effect. A convenient useful guide to the necessary *total* dosage to digitalization is one grain of the leaf, as pill or tablet, to each ten pounds of body weight or one *minim,* not drop, of the tincture per pound of body weight. These amounts are usually too small. Allowance must be made for the excretion of about two and a half grains of the leaf or twenty-five *minims* of the tincture per day if under full dosage. This allowance for excretion should be added to the total calculated dosage. The added weight of the edema should not be used in calculating dosage.

The total calculated dosage should be given in two or three days. A convenient scheme is to give one-half of the total calculated amount the first day in two or three doses, and one-fourth the total on each of the second and third days in divided doses. More may then be given if necessary to secure digitalis effect. It is to be stopped if at any time there are toxic symptoms, especially a *heart* rate below seventy, coupled beats, vomiting or diarrhea due to digitalis.

Inversion of the T wave in the second lead of

the electrocardiogram is usually the first indication of digitalis effect, not of toxicity.

When digitalization is produced a maintenance dose may be continued if there are no toxic effects and symptoms are still present or return. The maintenance dose in a particular case should be enough to keep him free of symptoms, especially from breathlessness. The amount is usually about that excreted daily, 2½ grains of the leaf or 25 m. of the tincture. Many need no maintenance dosage while some will need it the rest of their lives to keep them symptom-free.

Convalescence must be prolonged. At least two weeks in bed are necessary, most of the older patients requiring a longer time. Massage, passive motion, then active motion while reclining, followed by walking on the level should be the order of exercise. The first attempts at each kind of exercise should be seen and the effect on the heart noted. Unless the rate quiets normally the exercise is likely too much.

A safe rule for exercise is to stop if there is palpitation, precordial discomfort or breathlessness.

The use of digitalis in all cases which "may at some time in the future show enlargement" is seriously advocated by Christian in the *Journal of the American Medical Association* of March 18, 1933; and this at a time when the profession had come to realize that a heart which is normal in function needs only conservation of its reserve and not medication. If his dictum were followed, practically all cardiac cases no matter what their status, would be under digitalis therapy. Since nearly all cardiac cases eventually enlarge and since about one-sixth of the deaths in this country are cardiac, it would mean that several millions of our population would be on digitalis if this advice were followed. Congestive cardiac failure is not a deficiency disease as are myxedema, diabetes and pernicious anemia, but results from well-recognized etiological factors which produce hypertrophy and eventually failure. And digitalis like other hypnotics is not without toxic effects, which in medicinal amounts account for its beneficial action. The psychological effect on the cardiac of any such wholesale or continued administration by the general practitioner can result only in disaster. There is no way of proving that any such administration of digitalis to hearts not enlarged would be of any more value than would result if the therapy were "the essence of patience" and "tincture of time". If a choice had to be made it would seem better to adopt the recommendation of another eminent Bostonian and dump that digitalis to the fishes.

VARICOSE VEINS AND THE INJECTION TREATMENT*

BY GRANT P. PENNOYER, M.D.†

VARICOSE veins of the lower extremity are the source of an incredible amount of human suffering and disability. The circulatory difficulties, chronic painful ulcers and eczemata, which are the direct result of varicose veins, cause years and years of real pain, limited activity and economic loss. The actual number of these patients is much larger than is appreciated. Many of them endure their troubles without the help of the medical profession because they have become discouraged with the inefficacy of our usual medical attendance or are unable to meet the expense of the prolonged treatment required. The cost of the large amount of medical supplies which the ulcer cases require may be more than the fee which they can afford to pay.

Many people with large varicose veins apparently suffer no disability from them, but a review of the pathological physiology of these dilated superficial veins makes it clear why they are always a menace to the circulation of the lower leg and their elimination advisable. The impairment in the venous return of the lower leg, which they cause, is harmful, even in cases without symptoms of which the patient is conscious. There is always the danger of complication, and there is usually a fatigue and extra-weight sensation in the lower leg, which the patient may not connect with his veins, or which he has had so long, that he accepts it as natural.

The blood current in varicose veins, when the patient is erect, is downward toward the periphery instead of upwards toward the heart, as in the normal veins. This reverse flow of blood is the crux of the situation. Trendelenburg recognized this when he described in 1890 his famous test. His positive test depends upon the fact that these veins, after being emptied by elevating the lower limb, fill from above and not from below. Take the patient with the usual large subcutaneous bulging varicose veins and empty his veins by elevation, apply a rubber tubing tourniquet above tight enough to compress the veins and stand him up. The veins will usually fill slowly from below, but suddenly release the tourniquet, and the blood will rush into the dilated varicose channels with a palpable shock. These veins are not performing the

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†Pennoyer—Assistant attending surgeon, Roosevelt Hospital, New York City. For record and address of author see "This Week's Issue," page 1246.

function of veins, i.e., carrying the blood back to the heart, but are constantly pouring back into the lower extremity large quantities of spent venous blood to interfere with the nutrition of the lower leg, and add to the amount of blood returning by the deeper veins. These deeper veins, fortunately, rarely if ever become varicose and are adequate to carry the extra load in the usual case. The varicose veins in no way are helping the venous flow. Their removal, instead of decreasing the available paths for blood to return to the heart, tremendously improves the venous return and diminishes the burden on the normal veins. This constant regurgitation of old blood is certainly an undesirable state of affairs, and it is good preventive medicine to advise the removal of sizable varicose veins, even when they are not causing symptoms of which the patient is aware. Now that we have a method of treatment, which is inexpensive, safe and requiring no loss of time from work, we advise people, who are victims of this trouble, to seek treatment.

The primary cause of varicose veins and this reverse flow of blood is pressure. When one considers the rather delicate structure of the vein walls and measures the venous pressures to which the lower extremity veins can be subjected under certain conditions, it is surprising that we do not all have varicose veins. Not only is there the very considerable hydrostatic pressure due to the actual weight of the column of blood, but also the tremendous increase of the abdominal pressure incident to hard muscular efforts, pregnancy, etc. The venous blood of the lower extremity is normally kept from the backward flow, which would result from these two pressures, by very numerous flap valves. When the vein wall starts to dilate under the pressure, these valves become incompetent and as each succeeding valve gives away, the burden on the vein wall and remaining valves becomes so much heavier. The deeper veins have the support of the muscles and fascia, which prevents this process, but the superficial veins have nothing but the loose fat and not even that in thin individuals. A congenital, often familial, weakness of the vein walls may contribute to the process. As the superficial veins lengthen and dilate and succeeding valves give away under the pressure, eventually the whole superficial venous system becomes wide open channels with nothing to obstruct the downward rush of blood from the force of gravity and the positive abdominal pressure above. There are numerous communicating veins between the superficial and deep systems and normally the greater pressure in these dilated superficial trunks will cause the blood to rush into the deeper veins where the venous pressure is at a normal level. Careful readings of the pressure in varicose veins at various levels and in various positions have been made. In the erect position it is usually about equal to the weight of a column of blood the same height as the distance between the heart and the level measured. During violent contraction of the abdominal muscles, this is increased still more by the increase of abdominal pressure, which is naturally communicated to the connecting veins without valves.

The veins beneath the deep fascia are under entirely different circumstances, and never become varicose in the same way as the superficial group. They may become impaired due to some previous phlebitis or injury, but are too well supported to dilate like the superficial vessels under pressure. This contention is borne out by repeated personal observations in the dissecting room. The pumping action of the compression of these deep veins by the muscular contractions is the main and only important factor in propelling the venous return from the lower extremities. The propulsive force of the heart beat and arterial pressure is practically spent before the blood reaches the veins. The enormous area of the capillary bed, compared to the arterial area, retards the blood current in the capillaries so there is scarcely any pressure behind it. Compared with the pressure required to lift the blood back to the heart, it is insignificant. The muscles are always in a state of tonus and rhythmic contractions, the alternating pressure and relaxation of which, are constantly pumping the blood in the deep veins with competent valves toward the heart. Dangle your legs in a relaxed position and watch the veins of your feet distend. Exercise by a brisk walk and the veins of the normal feet will collapse. Actual measurements will show a tremendous fall in their venous pressure. During violent exercise the pressure in the normal veins of the feet will actually approach zero, due entirely to the rapid removal of blood from the veins by this pumping action of the muscles. This action is absent in the superficial veins and it is clear why they are subjected to so much more hydrostatic pressure than the deep group.

In the chest, abdomen and head the main propulsive forces in the venous circulation are the varying negative pressures in the thorax with each respiration, and the positive pressure in the abdomen, but these factors are of little or no help in the lower extremity as evidenced by actual recording of the venous pressures during respirations.

This review of the physiology of the venous circulation of the extremities makes it clear why varicose veins are a nuisance and a menace to their owner. They only add to the burden of the deep veins instead of themselves carrying blood to the heart. Large varicose trunks can carry more blood peripherally than is actually returned to the heart to be oxygenated

and to receive nutrition. Large veins with incompetent valves which communicate between the superficial and deep veins can furnish a channel for blood part way up the deep veins to flow back into the superficial varices, whence it again falls back toward the feet to reënter the deep veins. This vicious cycle of old venous blood has been actually observed under the fluoroscope with opaque material injected into varices. It undoubtedly is a common occurrence in ulcer cases. If a patient is placed in a horizontal position, this reverse flow of blood will cease. This explains the universal clinical observations that all symptoms of varicose veins are immediately improved by putting a patient to bed. If the symptoms are not relieved by the horizontal position, some other factor besides varices is at fault, probably the arteries or deep venous obstruction. If the varices can be blocked and this regurgitation stopped in that way, the same purpose is accomplished without putting the patient to bed.

This can be done to a certain extent by applying pressure bandages tight enough to keep the superficial veins collapsed. Elastic stockings, bandages, "elastoplast" adhesive bandages, Unna's paste boots all have their place in the treatment of varicose veins. If applied with correct even pressure they give great relief, but they are a terrible nuisance and few can apply them with sufficient skill to be really effective.

The injection treatment of varicose veins, when correctly used, is by far the most effective way of blocking this regurgitation of venous blood downward. It is still frowned upon by a few skeptics and ultraconservative members of the profession, but the method is now established as a safe and extremely valuable therapeutic procedure. The destruction of varicose veins by chemical means was attempted almost as early as the invention of the hypodermic syringe by Doctor Pravaz of Lyons, France, in 1851. Strong coagulating and corrosive substances were used, such as phenol, alcohol and mineral acids. These solutions, which coagulated the blood as well as destroying the intima of the vessel, were early recognized as very dangerous and the method discarded. In 1911, Doctor Linser of the Tubingen Skin Clinic noticed that a 1 per cent solution of bichloride of mercury, injected into syphilitic patients, often produced a very firm, permanent sclerosis of the arm veins. He used this solution to sclerose varicose veins with considerable success, despite its toxic effect. Dr. Sicard of Paris a little later began the use of aqueous solutions of sodium salicylate with remarkable success, and his work and publications have probably done more to popularize the treatment than that of any other one man. In 1928 he published a series of 325,000 injections without a single pulmonary embolus. Within the past eight years, the chemical destruction of varicose veins has been taken up by men scattered all over this country and abroad, so it is now a safe, reliable and extremely valuable therapeutic method. Huge series of cases have been reported which emphasize the value and safety of the treatment. Many skeptics still exist, but in my experience, they are men who have never given the method a fair trial or cannot overcome the doctor's innate dread of intravenous treatments, thrombosis and embolism. Some think the veins always recanalize. I have followed many of my original cases which I treated in 1928 when I began to use the method in the Roosevelt Hospital, New York City, and can testify that this is not true when the treatment is properly given. Our series at the Roosevelt Hospital now numbers over 1000 individual cases and many thousand injections, and I am convinced that this treatment is no passing fad. It has replaced the old operative method. The simplicity is a contrast to the surgical removal. Instead of a long hospital confinement with the anesthesia, incisions, long tedious dissections, sutures, scars and the numerous other necessary elements of the operative technique, a simple intravenous injection is done. It is an office procedure, and the patients continue with their regular work, with only moderate discomfort. The difference in cost, time, disability and danger of the two methods is very great. Also the injection can be given in the presence of infected ulcers and eczemata, where an operation would be impracticable without long preparation in bed because of the danger of infection.

The method has distinct limitations and contraindications, and the disregard of these will cause great dissatisfaction, and condemnation of this valuable therapeutic measure. Probably the greatest disappointment is that it does not remove the cause of varicose veins. By its use one can destroy the veins present at the time even more thoroughly than the surgeon can by excising them, but these individuals often develop more veins in the course of time. These patients probably have some constitutional, frequently familial, weakness in the venous system and the same venous pressure factors are always present. When the previously treated patient develops new varicose veins, he must not blame this on the treatment, which pretends to do no more than remove the veins present at the time he received his treatment. I always explain this limitation of the injection method to my patients to avoid future criticism. The same difficulty obtains in the operated cases. We have treated many cases in our clinic who have had one to several operations previously by our most distinguished surgeons. Stress has been made in the prevention of recurrence in the operated cases on removing the main trunk of the internal saphenous up to the saphenous opening. This has been done in

many of our cases with extensive new veins. The veins, which the surgeon has sent to the pathological laboratory in formalin, can hardly recur in a patient. New veins have formed and it is not the fault of the surgeon. Actual recurrence of injected veins can and does occur. Insufficient or too weak injection fluids may result in a chemical phlebitis not severe enough to destroy the vein, and after the inflammation has passed, the vein is still present. This is not a serious objection, as it is a simple matter to reinject the vein with a larger dose of a stronger solution.

Another disadvantage of the treatment is the danger of burns and the resulting sluggish, sloughing ulcers in lower extremities with impaired circulation and poor healing powers. The injected fluids are all caustic, statements of drug manufacturers notwithstanding. The principle of the treatment is a chemical destruction of the intima of the vein. If any of the injected fluid is deposited in the subcutaneous tissue instead of in the vein, it will produce a necrosis of that tissue. The actual ulceration of the skin and sloughing of the devitalized tissue may not take place for a whole month after the injection, the area of the injection meanwhile looking like a sluggish boil. If the leakage has been extensive, the destruction of tissue and skin may be apparent in a few days. These burns are extremely embarrassing and annoying, and often take months to heal. They are results in error of technique, the prevention of which I shall discuss later. They should not occur in more than one or two per cent of cases. Like infections in the clean operative wound, they will occasionally occur despite the best of care. I always mention the remote possibility of such a complication to patients contemplating the treatment. Otherwise it causes an awkward situation when they do occur, and the doctor and the treatment make unnecessary enemies. Patients have learned to accept the possibility of infection in the best of surgery, and they disregard the danger of it because with good technique it is rare. The same thing applies to this danger of sloughs in the treatment of varicose veins. The rare wreck of a railroad train is not regarded as a reason for refusing to use the railroads.

The treatment should never be given in the presence of an infectious thrombophlebitis. If there is a suggestion of a thrombophlebitis present, or having been present within a year, do not inject the case. The chemical irritation on top of an existing infection is like adding oil to a fire. This is an important point, as a subacute phlebitis, which might escape a casual examination, is not infrequently the immediate cause of the patient's seeking your advice as to his veins. The only cases of embolism occurring from the treatment have come when injections have been given in the presence of a phlebitis. Cases which have a history of milk leg and deep phlebitis, which is so common following pregnancy, abdominal operation and severe illnesses, have other factors present than simple varices. These patients often have permanent impairment of the deep veins and lymphatics. Edema and swelling are the most pronounced clinical symptoms. If the varices are small, the patient has a history of milk leg, and the chief complaint is a brawny hard edema, perhaps with ulceration, do not expect much from treating the varicose veins present. The difficulty is not a result of varicose veins but chronic venous and lymphatic obstruction. Other methods of treatment are necessary in these cases. The varices present may be purely incidental, or perhaps compensatory dilation for deep venous obstruction.

The blood in the destroyed veins may cause a little permanent brown pigmentation which may annoy people who are interested in the cosmetic effect of the treatment. The tiny venules, which occur right in the skin and cause the fine, unsightly cutaneous sprays almost like strawberry marks, are not suitable cases for treatment. If the venous trunk which feeds them can be detected, they may be cured or greatly improved by destroying this trunk. This limitation of the treatment is a disappointment to women, who are chiefly concerned with the appearance of their legs, but this type of vein is harmless as it is too small to be a real factor in the circulation.

Be very careful in treating people with advanced arterial disease. If the dorsalis pedis and posterior tibial pulses are both absent, I would not inject the case, unless the veins were large and I was firmly convinced the symptoms for which the patient sought relief were due entirely to his varicose veins. This is unusual, as the complaints are usually of arterial origin in these patients. Old age, diabetes, syphilis and high blood pressure are not contraindications, and great relief can be given to patients in these groups who have large veins causing disabling symptoms. It can be done in the presence of a pregnancy but I almost always wait, as there is usually a marked spontaneous regression in these cases after labor and the relief of the increased abdominal pressure.

The ideal cases for treatment are those with large subcutaneous varicose trunks without marked arterial disease and edema. If you are dealing with a true varicose ulcer, the effect of the treatment is sometimes astonishing. I recently treated a woman of eighty, who had had a large varicose ulcer for forty years. After a few injections her pain disappeared, and the ulcer healed in less than a month. It would be hard to find a more delighted or grateful group

of patients. If the ulcer results simply from varicose veins, the relation of the ulcer to the veins is usually intimate and obvious. Large trunks can be felt above the ulcer and often right under it. In these cases, when these veins are blocked, improvement in the ulcer is often noticed forty-eight hours after injection. If there is a hard, chronic edema of the whole lower leg, in which are embedded a few small varicose veins, which are not near or are just above the ulcer, your results from injecting the veins may be nihil. These cases have other factors at work besides the varicose veins.

The details of the treatment are extremely simple. Caustic solutions are injected directly into the lumen of the vein with the idea of destroying the intima of the vein, and yet not so caustic as to coagulate the blood or be toxic when diluted by the general blood stream. In the horizontal or slightly dependent position, the blood current in varicose veins is slow. This gives ample time for your solution to act on the vessel lining before it finds its way into the general circulation. When it reaches the normal veins, it is so diluted and is passed on so rapidly that it does no harm. I do not hesitate to inject large trunks in the upper thigh, having the patient horizontal, and using a tourniquet to keep the solution in the varicosity for about five minutes.

Numerous solutions are in use, and I am not convinced yet which one is best. They can be purchased from the standard drug companies in ampoules in proper dosage all ready for use. My original work was done with aqueous solutions of sodium salicylate, ranging in strength from 30 to 40 per cent, according to the size of the varix. For rapid, firm and permanent sclerosis, I still think that this solution is the most effective, but its injection is followed in a few seconds by a very severe cramp which lasts about a minute. Quinine and urethane solutions are more popular because there is no pain following their injection. The competition of clinics using this painless solution has forced me to abandon the salicylate except in very large varices where quinine has failed. Very excellent work can be done with quinine. It is the best solution for general use though it is a little less reliable than the salicylate solutions. Sodium morrhuate, 5 per cent solution, has been used extensively, especially in England. It is painless, and probably as effective as the quinine solutions. The average dose of all these drugs is contained in a single ampoule as it is purchased from the manufacturer. My choice is sodium salicylate if you are dealing with a husky patient, who would not be upset by a severe pain lasting about one minute, otherwise quinine solutions. Strong solutions of sodium chloride, glucose, invert sugar and various combinations of them can also be used, but have no special advantage in my opinion. Beware of the manufacturers' claim that a particular solution will not cause sloughs if there is leakage outside of the vein. The essence of the treatment is the production of a necrosis in the vessel intima, and this requires a caustic chemical which will undoubtedly destroy any tissue with which it comes in contact. I have seen sloughs result from all the commonly used solutions.

The only equipment necessary is a Luer syringe, a sharp, short bevelled needle, 22 to 25 gauge, a piece of rubber tubing for a tourniquet, alcohol to sterilize the skin, bandages, and the ampoule of injection fluid. My advice is to make only one injection at a time. I have seen patients very uncomfortable, thoroughly frightened and incapacitated for a considerable time by disregard of this advice. A chemical thrombophlebitis is produced in the injected vein and it is better to do only a little at once. The vein becomes hard, tender, often red and swollen. There may be some periphlebitis, particularly if you have used a large dose of drug for the size of the vein to be treated. The exact extent of the process is a little hard to control. I have seen the entire internal saphenous thrombosed from the ankle to the groin by a single injection, and in another patient the same dosage produced no sclerosis. There is a large individual variation in patients, as well as variations in the speed of the blood current and the amount of blood in the vein which dilutes your solution. The extent of the result of your treatment is apparent in twenty-four hours, and injections may be repeated daily or at any convenient interval according to the patient's discomfort. As veins, properly treated, are permanently destroyed, an interval of weeks between treatments does no harm. I usually have patients return once a week. This gives the acute inflammation of your previous treatment time to subside and the patients are much more comfortable.

To inject a varix of the lower leg of the average size, I have the patients sit on the edge of an examining table and put their foot in my lap, as I sit in an ordinary chair in front of them. This puts the leg at such an angle that the varices are sufficiently distended to be punctured easily and yet near enough to the horizontal so that the blood current is not too rapid for the solution to be effective. Do not use too small a needle. I use a 22 gauge, short bevelled needle. It is much easier to be positive that your needle is perfectly introduced into the lumen of the vein with this sized needle. The blood enters the needle in a good free stream, and the solution can be injected almost without pressure. With small needles like a hypodermic needle, this is difficult. Another important point is that the Luer syringe works without friction. A syringe that sticks will deceive you, and you cannot be positive you are in the vein. While injecting, I release the pressure on the plunger once or twice. With a needle as large as a 22

gauge, and an easily sliding Luer, blood will immediately freely rush back into your syringe, reassuring you that your needle is correctly placed. If there is the slightest doubt in your mind that your injection is perfect, do not inject. If your needle has been in and then out of the vein several times, or a hematoma has formed, do not inject. Success with the treatment depends more on your skill with venous punctures than on anything else. I explain to patients there is some luck in it, and do not hesitate to acknowledge failure of a treatment.

I begin with the lowest varices first. If the veins in the lower leg are all blocked, it is very much easier to get firm sclerosis of the larger trunks above. A tourniquet in these ordinary varices is not necessary unless the varices are extremely large. After withdrawing the needle, apply firm pressure to the injected spot a few minutes. Do not leave large varices above the knee. Even if you have been successful in getting permanent destruction of all the veins below the knee, the back pressure from large trunks above will cause the rapid development of new varices below, if it does not reopen the old ones.

The large trunks above the knee require a little more elaborate technique than the smaller ones below. They contain so much blood, which dilutes your injection fluid, that I inject them collapsed. The patient lies down and the needle is inserted into the vein. An assistant then empties the vein by raising the whole leg, and applies a tourniquet just below the saphenous opening before the injection is made. The patient should not move and the tourniquet is left in place three to five minutes. This gives your sclerosing fluid more time to act and lessens its dilution by the blood. The permanent sclerosis of these trunks above the knee is important in reducing the recurrences and formation of new veins.

After injecting, I apply an even pressure bandage, tight enough to keep the veins collapsed. This is not essential, and some men think it makes no difference. My feeling is that it helps considerably. The blood in the sclerosed vein forms a thrombus which has to organize into fibrous tissues. If the vein is kept collapsed, this thrombus is naturally much smaller and its conversion into fibrous tissue a shorter process. It is sometimes hard to find a successfully treated vein which has been well bandaged, while one that has thrombosed while distended with blood, can be felt as a thickened, tender, hard cord, often for months. If a patient has good elastic stockings, let him wear them until the treatment is completed, instead of using bandages.

The successfully treated vein becomes hard and sensitive. Usually the patient has no real pain but occasionally develops a painful periphlebitis with redness and swelling of the overlying skin. This subsides in a few days, and the patient may be comforted by cold compresses and rest. If this has occurred, use a smaller dosage next time. I usually plan to do six to eight inches of a vein at a treatment. If this is accomplished each time, six to ten injections in each leg will complete the treatment in the average case.

Considerable study has been made of pathological sections of injected veins. The first step is a necrosis of the intima. A fibrin deposit, inflammatory cells and blood clot obliterate the vein in one to four days. A growth of fibroblasts into this clot organizes it and eventually the successfully treated vein becomes a firm, fibrous cord which can often be felt permanently beneath the skin. The entire process requires several weeks. I explain this sequence of events to the patients so they will know just what to expect and not be alarmed by the hard, thrombosed vein.

In closing, I might add one or two little clinical points. The transmission of a fluid wave from a percussion tap along varicose veins helps very much to follow their course, especially when they are buried in fat. A quick blow with the finger can be felt as a distinct impulse in the vein anywhere in its course. Not only the location but the communications of the veins can be studied in this way. This is especially useful in treating ulcer cases and locating the trunks in the thigh, which are frequently lost in fat.

Let me also remind you of the work of Dr. Homans in the treatment of the calloused, indurated ulcers in limbs with hard, brawny edema and elephantiasis, associated with chronic lymphatic stasis and chronic infection. These are not simple varicose ulcers, and cannot be helped much by injecting the veins. The patients usually give a history of a typical milk leg or phlegmasia alba dolens. Excision of the underlying deep fascia, and skin graft is the only cure for extreme cases of this type.

To summarize, varicose veins can be permanently destroyed by the injection method. The method is simple, safe, easy, inexpensive and ambulatory. Large varicose veins are always a menace to their owner and should be treated even when they are not causing symptoms of which the patient is conscious. Simple varicose ulcers can be healed quickly by this method.

MISCELLANY

THE FRANKLIN COUNTY MEDICAL SOCIETY

The Franklin County Medical Society met at the Tavern, St. Albans, Vermont, November 1. Dinner was served to the members and their wives after which Dr. Thomas Hays, of Burlington, and Dr. Bradley Soule, of the Mary Fletcher Hospital, gave

talks on Arthritis. Their papers were illustrated by lantern slides and x-ray pictures. About twenty members were present.

On December 6, Dr. Ivan Y. Patrick addressed the Society on the subject of "Some New Things in Obstetrics."

Dr. Berkley has resumed his practice after having been confined to his house by illness for several weeks.

THE NORTHEASTERN MEDICAL SOCIETY

The Northeastern Medical Society met at the Newport House, Newport, Vt., November 10, 1933, for their first quarterly meeting. There were twenty-two members present.

Dr. R. E. Powell of Montreal was the speaker for the evening and gave an illustrated talk upon Genito-Urinary Infections.

The January meeting of the Society will be held in St. Johnsbury, Vt.

THE RUTLAND CLINICAL CLUB

The Rutland Clinical Club held the first of a series of winter meetings Tuesday evening, November 14. Dr. J. F. Burgess, dermatologist, of the Montreal General Hospital, gave a very interesting talk on skin diseases and their management. There will be a series of eleven meetings, the speakers for which will all be members of the Montreal General Hospital.

Dr. Clarence F. Ball is in the Rutland Hospital recovering from the effects of a fall on the ice. It is hoped he will be around in a few days.

Drs. Harry Ryan and Clarence Ball attended the meeting of New England Railway Surgeons in New York.

Dr. Maurice Bellerose, who is finishing a three-year orthopedic service at Cornell Medical School, spent the week-end at his home in Rutland. He expects to locate here in the spring.

Dr. Francis E. Quigley has gone to New York to take some postgraduate work in obstetrics. He will also take a course in the newer methods of anesthesia, and will investigate new apparatus for the Rutland Hospital.

Dr. Frank Smolinski has located in West Rutland.

Dr. Lester E. Judd has located in Brandon.

AN EXCERPT FROM THE ANNUAL REPORT OF THE MILBANK MEMORIAL FUND

Disappointment over the final report of the Committee on the Costs of Medical Care, the chief financial supporter of which was the Milbank Memorial Fund, was expressed in the annual report of that foundation, made public recently. It was made clear that the Fund considers its investment well worth while because of the important factual contributions by the Committee's staff to the knowledge of the problems underlying medical care. "It is a matter of extreme regret, however," said John A. Kingsbury, secretary of the Fund, in the introduction to the report of the Fund, "that the Committee failed to propose a comprehensive program which would solve the basic problem which it uncovered.

"This failure," said Mr. Kingsbury, "cannot be ascribed wholly to a lack of vision or of courage on the part of all its members; in all fairness, it should be said that much of the fault lay with obstructionists' tactics on the part of certain groups of physicians who generally control medical organizations and often are able to use the great prestige of these organizations to prevent, rather than to promote, the delivery of adequate medical services to all of the people. Such an attitude is difficult to understand at the moment since it is obvious that no solution will meet the underlying problems of providing medical care to all of the people which does not, at the same time, provide better facilities for scientific medicine as well as higher compensation for the rank and file of physicians; which does not safeguard the confidential relationship between patient and doctor, and which does not guarantee the freedom of choice of physician to the patient and full scope, for the physician, for private practice among that portion of the population which can afford to pay for it. But looking at the history of medicine and public health in perspective, such an attitude is not so strange as it appears; it has characterized the practice of medicine for centuries. As in other instances, when the public good becomes predominant, this phase of medicine will pass and a comprehensive plan will emerge and will be adopted."

The need for a national health plan is emphasized in the report "which would embrace public health and preventive activities, private medical and voluntary social services, and properly directed measures for strengthening economic security for the entire population.

"A plan for the conservation of the people's health on a national scale," said Mr. Kingsbury in comment, "ought to be given immediate consideration. A critical condition is facing the health authorities in many sections of the country due to diminishing support of public health services. Since 1931, appropriations for these purposes have been cut in forty of the forty-eight states of the Union an average of ten per cent. In some states the reduction in appropriations for public health has amounted to sixty per cent. This means that many counties, cities, and even whole states have been obliged to abandon vital health services. This is notably true in the states of Alabama, New Mexico, the Dakotas, and of Indiana where the State Department of Health has been virtually abandoned. The seriousness of the situation is aggravated by the depression. The demand for medical services, both preventive and curative, has increased. Existing clinic facilities are over-taxed, the 'case load' of visiting nurses is far too heavy, physicians are burdened with charity practice, and public health depart-

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STUDIES OF REPRODUCTION IN THE RAT*

III. Vitamin E—Neutralized When Mixed With Lard

BY DONALD MACOMBER, M.D.†

As already reported in Part I of this study, the control diet was at first made up as follows: casein 20 per cent, salt mixture 4 per cent, starch 51 per cent, wheat germ 5 per cent, lard 20 per cent. To this was added three drops of a powerful cod liver oil (Patch's) and 0.2 Gm. of powdered dried yeast (Harris). This diet was fed from October first to November eighteenth. The reproductive performance of ten control animals was observed during this period in order to test the quality of the diet before proceeding with the experimental work (Part I —Effect of reducing the amount of protein. Part II—Effect of reducing the total amount fed). All ten became pregnant. One rat died from anesthesia during an operative inspection of ovaries and uterus. Five pregnancies went to term with the birth of 44 young, but in no instance were the mothers able to nurse their young (perhaps because of rather small amount of yeast). Four pregnancies ended in absorption.

Such a high percentage of absorptions indicated that something was fundamentally wrong with the diet, probably in the nature of a relative deficiency in the vitamin E content. This was the more puzzling as 5 per cent wheat germ would seem adequate as a source for vitamin E. In 1927 the author[3] had reported an extensive series of experiments regarding reproduction on a diet deficient in calcium. The controls for this experiment were on a normal diet containing casein 20 per cent, salt mixture 4 per cent, starch 56 per cent and lard 20 per cent. To this was added 0.2 Gm. of yeast, 0.2 Gm. of cod liver oil and 20 Gm. of lettuce per rat per day. Thus lettuce acted as a course of vitamin E and the diets differed only in that the 1927 diet contained lettuce and the diet reported in this paper contained 5 per cent wheat germ. For simplicity we will designate them as the lettuce diet and the wheat germ diet respectively.

Though the diets were so similar, the reproductive performance was very different indeed. Twenty-seven rats were kept on the lettuce (1927) diet and they were observed in 81 pregnancies. Of these only six ended in absorption, though there were two additional instances where there was some doubt whether pregnancy had occurred at all. Including these, in order to cover every possible case, the percentage of absorption was 9.9 per cent. As reported above on the wheat germ (present) diet there were absorptions in 44 per cent of the pregnancies. It was therefore determined to double the amount of wheat germ in order to correct what seemed like a lack of vitamin E. Just at this time, however, Evans and Burr[2] reported similar results with a mixture of wheat germ and lard. They had previously established that 250 mgm. of wheat germ and 250 mgm. of yeast always resulted in normal pregnancy even when the female had been previously found sterile from an experimental E deficiency*. They then mixed wheat germ and lard in different proportions and added it to the diet of several series of experimentally sterile female rats in such amounts that the daily amount of wheat germ consumed was at least 250 Gm. per rat per day. As long as the lard did not exceed 7.7 per cent, reproduction was normal. When the lard was 22 per cent one litter of one dead rat was produced out of eight pregnancies. The rest ended in absorptions. On further experimentation they found that with 500 mgm. of wheat germ or more per rat per day normal pregnancies resulted even with more than 25 per cent lard. Finally they experimented with other fats and came to the conclusion that certain fats, notably lard, oleic acid and Crisco, have the property of neutralizing the effectiveness of wheat germ as a curative of vitamin E sterility, whereas butter has no such effect. In 1928 Waddell and Steenbock[4] reported that ferric chloride mixed with a normal diet in the proportion of one per cent would produce complete and typical vitamin E deficiency sterility. In 1931 Cummings and Matill[1] called attention to the relationship between the degree of auto-oxidizability of certain fats and the sterility which resulted in animals when these fats were fed. They found that wheat germ oil delayed auto-oxidation and suggested that that may be the true rôle of vitamin E in preventing sterility. That same year Waddell and Steenbock[5] in attempting to explain the action of iron in making vitamin E ineffective produced evidence that the vitamin E is not destroyed in the process but in some way neutralized by what they call "Anti-vitamin". They then called attention to the work of Cummings and Matill, noted above, and said in part, "It follows, therefore, that the amount of Vitamin E in any diet is markedly influenced by the balance between anti- and pro-

*The experimental work upon which this paper is based was carried out in the Research Laboratory of the Department of Obstetrics, Harvard Medical School. It was aided by grants from the Delamar Fund.

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*It will be seen therefore that our rats (present series) had ample Vitamin E, for on 10 Gm. of diet (less than the average amount ingested) they would get 500 mgm. of wheat germ daily and 200 mgm. of yeast.

oxygenic substances. It is very probable that what we have termed Antivitamin is prooxygenic in character. Regardless of what name is applied it is apparent that it has a profound effect not only in the ration but also in the body of the rat."

To return to the present series let me repeat that even 500 mgm. or more of wheat germ per day when mixed with a diet containing 20 per cent lard did not protect against sterility in 44 per cent of the females, whereas in the 1927 series 20 Gm. of lettuce fed separately did protect more than 90 per cent, though in this instance also 20 per cent of lard was incorporated in the diet. Since the main purpose of the present series was to investigate the effect of changes in protein and energy content upon reproduction, the composition of the control diet was promptly changed on November seventeenth to the following—casein 20 per cent, wheat germ 5 per cent, salt mixture 4 per cent, starch 51 per cent, butter 16 per cent, cod liver oil 2 per cent and yeast 2 per cent. No further trouble with absorptions was found.

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III

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AN EXCERPT FROM THE ANNUAL REPORT OF THE MILBANK MEMORIAL FUND

(Continued from page 1234)

ments are unable to carry on essential preventive activities.

"The warning given more than a year ago by Dr. William H. Welch, the Dean of American Medicine, at the annual meeting of the Fund's boards of counsel and widely published at the time, is coming true. It will be recalled that Dr. Welch then said: 'Too great economy as far as health is concerned, because of the current depression, is particularly dangerous to the welfare of growing children. Undernourishment of children is not likely to show itself immediately, but is bound to show its effects later, when it is probably too late to remedy. The ground lost by undernourishment in childhood may never be regained.' Already the reports are coming in of increased malnutrition among school children, of higher sickness rates among the unemployed, and of rising infant and tuberculosis mortality in areas hard hit by the depression."

Mr. Kingsbury pointed out that New York State had set a notable example under the leadership of President Roosevelt when he was Governor, in formulating a state health program by the appointment of a State Health Commission. He recalled the introduction to the report of this commission in which Governor Roosevelt said: "Nothing can be more important to a state than its public health," and expressed his conviction that the President, in the near future, would take the initiative in the nation as he did in the State of New York in furthering the public health through the adoption of a comprehensive national health plan.

The Fund is continuing its studies of insurance against unemployment, costs of medical care, and loss of wages during sickness as possible means of aiding greater economic security, and is concentrating much of its interest upon the development of practical ways in which public health administration may be made more effective.

The grants of the Milbank Memorial Fund for all purposes in 1932 totaled $338,004.55, bringing to $9,325,580.25 the aggregate amount of its appropriations since its foundation in April, 1905. Aside from substantial grants made to emergency unemployment relief, totaling $612,500 in three years, the principal interests of the Fund, as estimated by its grants, continued to be in public health and closely related fields.

THE SIXTH GORGAS ESSAY CONTEST

Contest for High School Students Deals with Importance of Mosquito Control

The sixth annual essay contest for high school juniors and seniors sponsored by the Gorgas Memorial Institute, Washington, D. C., was announced December 11 by Admiral Cary T. Grayson, President of the Institute.

The contest opened in all high schools on Monday, December 11, and will close on Friday, February 16. The subject will be "Past Benefits and Future Importance to Man of the Control of Disease Bearing Mosquitoes." The donor of the prizes is Mr. Henry L. Doherty, President of the Henry L. Doherty Co., New York City. Mr. Doherty, who for years has been interested in the control of mosquitoes, was also the donor of awards of the Institute's previous contests on two occasions.

High school winners will receive a Gorgas medal, and will qualify for entrance in the State contest. State winners will be awarded $10 in cash, and will qualify for entrance in the National contest. The winner of the first national prize will receive $500 in cash, and a travel allowance of $200 to Washington to receive the award; 2nd National prize will be $150 in cash, and 3rd National prize $50 in cash.

Winner in each high school will be selected by a faculty committee appointed by the principal. The winning essay, with official entrance blank and photograph of the winner will be forwarded by the principal to the Gorgas Institute, for entry in the State contest. A committee of three State officials will judge the winning school papers and select the winner in each State. The winning State essays will then be entered in the National contest, the judges of which will be the U. S. Commissioner of Education, the Surgeon General of the U. S. Public Health Service, and the Director General of the American College of Surgeons.

For detailed announcement and instructions write to the Gorgas Memorial Institute, 1331 G Street, N. W., Washington, D. C.

CASE RECORDS
of the
MASSACHUSETTS GENERAL HOSPITAL

ANTE MORTEM AND POST MORTEM RECORDS AS USED IN WEEKLY CLINICAL-PATHOLOGIC EXERCISES

EDITED BY RICHARD C. CABOT, M.D.
F. M. PAINTER, A.B., ASSISTANT EDITOR

CASE 19501

PRESENTATION OF CASE

DR. A. S. ROSE*: A fifty-eight year old white married Italian shoemaker entered with the complaint of abdominal swelling of three weeks' duration.

Eight years before admission, when apparently perfectly well, he suddenly spat up bright red and dark colored blood amounting to two or three cupfuls. He was put on a milk diet at a hospital. A year or two before admission he suddenly passed large quantities of bright red blood by rectum. At this time he complained frequently of an empty feeling and rumbling in the stomach, relieved by food. According to his wife he also vomited a small quantity of blood at the same time. Between these two episodes he had been in excellent health. Eight months before admission he began having sudden chills and fever during the night and late afternoon. The chills were often so severe that his bed would shake. Following the chill he broke out into a profuse sweat, drenching his clothes. These attacks occurred about once a month at first, then gradually increased to about once a week. Three weeks before entry he appeared to be getting worse and he noticed that his abdomen was getting much larger. Eight quarts of fluid was removed from his abdomen at a hospital. There had been about fifty pounds loss of weight during the past few years.

The patient had always been a large eater and drank about a gallon of wine daily.

He had been married thirty years. His wife was living but was suffering from chronic Bright's disease. There had been no children and no miscarriages.

Physical examination showed a well developed but only moderately well nourished man. There was slight icterus of the sclerae. The pupils were slightly irregular. The teeth were ill kept. There were occasional medium moist râles at both bases. The size of the heart was not made out. The sounds were distant and of only fair quality. The blood pressure was 120/80. The abdomen was markedly distended, with shifting dullness and fluid wave. The abdominal veins were moderately distended. There was slight pitting edema of the ankles and sacrum. The knee jerks and ankle jerks were not obtained.

*Senior interne on the East Medical service.

The temperature was 98°, the pulse 82. The respirations were 14.

Laboratory examination showed the urine to be dark amber colored, specific gravity 1.016, no albumin or sugar, questionable bile. Blood: hemoglobin 80 per cent, red cell count 4,700,000, white cell count 13,500, 85 per cent polymorphonuclears. The stools showed a four plus guaiac. The Hinton test was negative. A liver function test showed 30 per cent retention. The icteric index was 10, the van den Bergh 1 to 1.5 milligrams, direct reaction, the non-protein nitrogen 44 milligrams.

Immediately following admission an abdominal tap was performed, following which the liver was felt six or seven fingerbreadths down. The spleen was not felt. The day following admission the patient was cold, sweating, and almost comatose. The pulse was very weak. He died on the same day.

DIFFERENTIAL DIAGNOSIS

DR. CHESTER M. JONES: The diagnosis in this case is either very obvious or else there is something very peculiar in the picture which does not stand out.

There are several factors of interest, I think, that are rather difficult to correlate, although I think they probably can be correlated. The first thing in the story is that we are told that he brings up a large amount of blood, apparently from the stomach, eight years before admission. We do not know anything about his previous symptoms, because the history is too inaccurate, but apparently there was frank hematemesis. We cannot be certain that the blood did not come from his lungs or nasopharynx, but there is no reason to believe that it did. The only fact that goes with the story of unexplained hematemesis is that he drank a gallon of wine a day, more or less, and it is true that one can have definite hematemesis of large amounts of blood without any demonstrable ulcer, but simply from chronic gastritis associated with heavy alcohol intake.

I think the initial statement, when we couple it with the fact that he is known to be a chronic alcoholic, suggests that he has chronic gastritis and that the initial hemorrhage was due to that fact. That is the most logical explanation one can make, but the story is so inaccurate that it is hard to tie it together.

I do not believe it is possible that he has cancer. I do not believe he has polyposis. I do not think any of these things are at all logical. The fact that he was put on a milk diet and told, as he was, that he had an ulcer, and the fact that he improved on this diet do not prove that he had ulcer. Almost any gastric lesion will improve on an ulcer régime and usually the bleeding will stop. If he had gastritis that was perfectly good treatment for such a condition.

We are not told whether he was x-rayed or not. Eight years is a long interval between

hemorrhages from an ulcer without intervening symptoms.

He apparently goes along feeling fairly well until about a year and a half before admission and then he passes a large amount of blood by rectum. This of course complicates the diagnostic picture. If we make two separate diagnoses we can say he has a bleeding gastric lesion of some sort which has not caused further trouble for six years or more, with the late appearance of hemorrhoids, which are the most common cause of rectal bleeding, or we can assume that he has another disease. A common cause of rectal bleeding at the age of fifty-six of course is cancer, but he has had no symptoms to suggest any colonic lesion that is of fairly recent origin.

Hemorrhoids with profuse bleeding can perfectly well fit into the picture associated with alcoholic gastritis, if we add the factor of cirrhosis. He has continued to drink without intermission, except for the period in the hospital when he was on a milk and cream diet, and hemorrhoids are sometimes fairly important clinical findings in the presence of cirrhosis.

Again, if we want to include the diagnosis of polyposis and say that he has polyps in the stomach with resulting hemorrhage at one time from that, and later bleeding from polyps of the intestine, that is a possibility, but not a logical one.

He complained of an empty feeling and rumbling in the stomach. I suppose that means the epigastrium. That is perfectly characteristic of either ulcer or alcoholic gastritis. "Dry heaves" are pretty unusual with ulcer and are associated with alcoholic gastritis.

At this time he is said to have again vomited some blood in fairly small amounts. That simply shows us that if we do not make a second diagnosis we have to assume that it is the same condition he had eight years ago, which certainly rules out a malignant process, or should rule it out, and there again we are back to a chronic condition which is most probably a true chronic gastritis. The history is too inadequate to warrant anything but diagnostic speculation.

After this late hemorrhage he takes a little better care of himself and feels much better for a month.

Eight months before admission he comes into the other hospital with a new set of symptoms which are difficult to explain on the basis of one diagnosis. He had sudden chills and fever, and these were described as really severe chills. "Following the chill he broke out into a profuse sweat, drenching his clothes. These attacks occurred about once a month at first, and then gradually increased to about once a week." I do not think it is fair to say that chills are characteristic of cirrhosis, but fever most certainly is, and drenching sweats are characteristic of cirrhosis in a fairly active stage. I have seen cases of cirrhosis with chills, so that if one wishes to say a chronic alcoholic with chronic gastritis due to alcohol, and cirrhosis due to alcohol and hemorrhoids associated with cirrhosis I think the picture fits fairly well. I am a little worried by the fact that he is having chills. One wonders if there is not an infection of some sort. Recurrent attacks of chills are not characteristic of cirrhosis of the liver, although it is true that almost every cirrhosis patient who comes into the hospital during his stay in the ward has an elevation of temperature and sometimes striking elevation with very few symptoms to go with it. If the elevation is marked there is usually sweating too. The causes for chills are few, other than such conditions as do not seem to fit this picture. Malaria is certainly a very distant possibility. He was born in Italy. He might have chronic malaria, but I do not see how it fills the bill. There is no story of chills and fever in the past.

The question of the possibility of perinephric abscess for one reason or another does not seem to me to be at all pertinent to this picture.

He finally goes to a hospital where he is told he has liver disease and he develops ascites. Ascites certainly fits a diagnosis of chronic intrahepatic disease, probably due to or associated with a large alcoholic intake.

The next question that ought to be considered is his trade. The only hazard that we have in shoemakers is benzol poisoning. I see no reason for assuming it enters into this picture.

As far as the marital history is concerned, there have been no pregnancies, and I suppose we have to raise the question of syphilis, but that is the only indication for such a diagnosis.

The physical examination as given by Dr. Rose is important. The patient is slightly jaundiced, indicating intrahepatic disease in all probability, but the odor of his breath is important if true. If it is true that he had a breath that was mousey, there is only one condition that will give it and that is terminal liver disease, usually in association with yellow atrophy. It is very much like or is the odor of acetamide. In cases of acute yellow atrophy we aways find this odor on the patient's breath.

The pupils were slightly irregular. That may or may not be of any significance. There is no mention made that they did not react. That is not very suggestive that the whole situation is due to syphilis.

Occasional moist râles at both bases could go perfectly well with cirrhosis of the liver and ascites. Hydrothorax on one or both sides is not at all uncommon towards the end of cirrhosis of the liver regardless of the cause of the disease.

The heart does not enter into the picture. He may have a certain amount of vascular arterial change, but one would expect that at fifty-eight.

The abdomen is described as having shifting dullness. He has ascites. He has been tapped before. An abdominal tap which yielded sev-

eral quarts was done, but we are not told anything about the fluid, which might help us a bit. After tapping the liver was felt six or seven fingerbreadths down. Unfortunately no mention is made of the upper border of liver dullness. I assume it is a very large liver. It probably is enlarged to the left as well as downward.

The spleen was sought and not found. That is a little unusual in cirrhosis with ascites, but I have been struck by the fact that in many instances a person may have a really large spleen, two, three or four times normal and yet one cannot feel it at all. It may be fixed under the diaphragm due to perisplenitis with adhesions to the diaphragm and cannot be felt. At necropsy it is evident that the spleen is enlarged, so the failure to feel it in this case is not proof it was not enlarged.

The abdominal veins were distended, as one would expect with ascites. It is the thing to expect rather than not to expect.

Edema of the ankles and sacrum is not at all uncommon where liver disease has reached a point where there is real liver insufficiency. I do not believe it is due to obstruction to the vena cava. It is probably associated with hepatic insufficiency as regards nitrogen metabolism.

The fact that the ankle-jerks and knee jerks were not obtained simply makes it difficult to exclude syphilis. Except for that fact that they were not obtained I do not see why we have to include syphilis in the picture. A chronic alcoholic may have syphilis, and it is possible that this man had it, but I see no necessity for making a diagnosis of syphilis of the liver.

The rectal examination is not reported. I assume it was negative.

DR. ROSE: There was no growth in the rectum.

DR. JONES: A four plus guaiac is due either to bleeding higher than the rectum itself, due to a tendency to bleed, or to some sort of growth. There were no external hemorrhoids, otherwise they would have been noted. It is not at all uncommon to have positive guaiacs where there is hepatic insufficiency. In most cases of prolonged jaundice a one or two plus guaiac running fairly constantly throughout the course of the stay is common. A four plus guaiac is more uncommon. It raises a little doubt as to the explanation of cirrhosis causing the bright red blood and the strongly positive guaiac in the stool. But it is possible to get bleeding in severe liver disease, and obviously this man is very sick. He came into the hospital in extremis, and he might well have a mucous membrane which is bleeding rather readily.

The laboratory examinations help us a little. The urine is essentially negative. No mention is made of the sediment, therefore I assume it was negative.

He apparently has no anemia, but I feel he is dehydrated. The red count is 4,700,000. That may be a false figure, although it may be a correct count; in the presence of dehydration we know that the red count can be elevated. It is rather striking however that he has no real anemia, if cirrhosis is the only explanation and if he has had cirrhosis for some time. Most of the cases of cirrhosis that come in with symptoms have an anemia in the region of 3,500,000 and I am surprised he has not a lower red count. It may be that his initial symptoms are due to alcoholic gastritis and that cirrhosis as such is a later development in the picture.

A white blood cell count of 13,500 with eighty-five per cent polymorphonuclears can occur either in relation to infection or in relation to hemorrhage. He has not had gross hemorrhage just before he came in. I am wondering if he has not a good deal of perihepatitis and a peritoneal reaction which may be giving him a leukocytosis.

I am rather surprised that he has no fever, but with this picture it is possible that a rectal temperature would have shown a much more definite elevation.

The Hinton is negative, therefore I see no reason to drag syphilis into the explanation of symptoms or physical findings.

A bromsulphthalein test shows a 30 per cent retention, which is a relatively high figure, particularly in the absence of jaundice. The jaundice is not striking, just barely clinical jaundice, and this extreme dye retention means severe intrahepatic disease without any question.

The icteric index and the van den Bergh mean simply slight jaundice.

The non-protein nitrogen probably can be explained on the basis of dehydration without anything else.

In the last notes immediately following admission, as I said, the liver was felt six or seven fingerbreadths down. There is no description of the edge of the liver. I assume it was not unusual.

DR. WYMAN RICHARDSON: I might say that I was unable to feel that liver.

DR. JONES: It was certainly not a large nodular liver.

The day following admission the patient was cold, sweating and comatose, and the pulse was weak. Was the rate rapid?

DR. RICHARDSON: Yes.

DR. JONES: He died on the same day.

Death in this case can best be explained on the basis of one of two possibilities, either terminal hepatic insufficiency or hemorrhage, and so far as there is no story of hemorrhage except the four plus guaiac there is no reason to

presuppose it, although he may have bled into the stomach and the intestinal tract.

It is rather difficult to correlate all the findings, particularly the story of chills, with alcoholic cirrhosis, so-called toxic cirrhosis, and chronic gastritis should logically cause the initial symptoms. In view of the rapid march of events over a period of three weeks before admission I shall not be at all surprised to find more or less evidence of acute yellow atrophy on top of cirrhosis, with the development of ascites and with rapid termination of the whole picture.

I am much interested in Dr. Rose's description of this man's death, because if that is correct we usually find it in acute yellow atrophy. We have occasionally seen patients with acute yellow atrophy and no jaundice. The absence of deep jaundice does not rule out such a condition. In this case it ought to be superimposed upon cirrhosis.

I think the stomach will show chronic gastritis, possibly with superficial erosions. I do not believe he has malignancy. If he has, in relation to this picture it might be primary carcinoma of the liver, but I see no reason for believing he has such a condition.

DR. TRACY B. MALLORY: Dr. Richardson, you had a chance to see and smell this patient. Have you anything to say?

DR. RICHARDSON: In the first place he did have a very definite breath that suggested to me liver insufficiency. I remember a patient in the Outpatient Department who had nothing but this peculiar musty odor to his breath. He seemed very well and did not wish to come into the hospital. He did, and he died in three weeks with yellow atrophy of the liver.

This patient was practically moribund when we first saw him. I was unable to feel his liver. I think that Dr. Rose was unable to feel his liver. Dr. Capps found the liver quite definitely palpable. I felt fairly certain that the man was dying a hepatic death, a death due to actual liver failure, and I assumed that that was due to an alcoholic cirrhosis.

I do not think we paid enough attention to the chills and fever in the history. I was interested to hear Dr. Jones say that they may have been due to liver disease alone.

The positive guaiac we interpreted as being due possibly either to gastritis or to hemorrhage from a dilated vein.

I think edema is interesting in cases of liver disease. I wish that Dr. Jones would explain why these people have edema. I know that in certain cases salyrgan may cause a very marked diuresis.

DR. WILLIAM B. BREED: I was interested in Dr. Jones's emphasis on chronic gastritis as the cause of the hematemesis. Perhaps it was the time element that made him emphasize that more than a bleeding esophageal varix, which would seem to me the most probable cause of such bleeding.

DR. JONES: There was no other evidence of cirrhosis at the time. It may have been due to a varix, but eight years is a rather long interval, and we can perfectly well have bleeding from a gastritis.

CLINICAL DIAGNOSES

Cirrhosis of the liver.
Chronic alcoholism.
Hepatic insufficiency.

ANATOMIC DIAGNOSES

Cirrhosis of the liver, alcoholic type.
Adenocarcinoma of the transverse colon.
Esophageal varices.
Ascites.
Paracentesis.
Duodenal ulcer, healed.

PATHOLOGIC DISCUSSION

DR. TRACY B. MALLORY: We found of course an alcoholic cirrhosis, as was predicted.

As regards his hematemesis of eight years previously, he had the definite scar of a healed duodenal ulcer, and also esophageal varices, presumably of later date. The ulcer would seem the more probable source of the hemorrhage.

In reference to the positive guaiacs in the stools and the feeling by one examiner of a presumably enlarged liver, we found a large carcinoma of the transverse colon. It did not obstruct and had not metastasized, however, so I think there is no question that the essential primary cause of death was alcoholic cirrhosis of the liver. It is interesting to note that his history was one primarily of wine drinking in extraordinarily large quantities. In general cirrhosis is found in association with the consumption of hard liquors rather than of wines.

DR. JONES: I should like to ask one question about the stomach. What was it like?

DR. MALLORY: It showed a definite degree of gastritis.

DR. JONES: That could occur with duodenal ulcer too?

DR. MALLORY: Yes, although the ulcer was so completely healed that alcoholism seems the more probable cause.

DR. JONES: As for Dr. Richardson's question in regard to edema with cirrhosis, it is peculiar that we may get edema, not infrequently peripheral edema, before the ascites is found. It may occur at least a year before the ascites, if not longer. My feeling is that in these cases there is a disturbance which involves the whole problem of water balance. I do not know the answer. I think the easiest way to answer is to say that it is due to hepatic insufficiency. There is usually a marked lowering or invasion of the albumin-globulin ratio or a drop in the serum pro-

tein. Whether there are other factors involved I do not know. Why salyrgan works in some cases and not in others I have not the slightest idea.

CASE 19502

RECURRENT ATTACKS OF VOMITING IN AN ELDERLY MAN

Presentation of Case

Dr. F. Dennette Adams: A seventy-three year old retired business man was admitted to the hospital for the second time June 4, 1933, because of drowsiness, loss of weight, and for the previous twenty-four hours vomiting of blood and passing of blood at stool.

At the age of about fifty he had had typhoid fever without complications but with a long convalescence. For years he had been a hearty eater, a habitual drinker and had always been overweight. He had averaged probably two or three cocktails before dinner and probably two or three highballs after dinner for many years. He rarely drank to excess. In the course of an insurance examination in 1924 he was discovered to have diabetes, but had no consistent treatment until 1927, when he put himself into the hands of a diabetic specialist. At that time he weighed 210, had a pulse rate of 90, a blood pressure of 176/100. The heart was somewhat enlarged but apparently was functioning well. The liver was felt 3 centimeters below the costal margin and the spleen one centimeter below. This was the only time at which the spleen was definitely felt, although the liver was invariably palpable. He was put on the proper treatment but did not conform too well and showed sugar in the urine on most of the visits to his physician. In 1928 a routine x-ray of the heart showed moderate enlargement with sclerosis of the aorta. During the same year he developed almost total blindness which was thought to be caused by toxic amblyopia. Complete elimination of tobacco and reduction but not exclusion of alcohol intake were attended by improvement and in the course of a year he almost entirely recovered his vision. In 1929 because of indigestion the gall bladder was x-rayed. It did not fill well with dye, but a faint shadow was seen and there was no evidence of stone.

In November, 1931 because of recurrent attacks of vomiting during the previous three or four weeks he consulted another physician. There had been no pain, simply attacks of nausea with vomiting, and as might be expected in one so heavy, gradually increasing dyspnea for several years. His bowels had been constipated always, a little more so recently. The findings on physical examination at that time were weight 198; heart definitely enlarged to the left, with an occasional premature beat and a faint systolic murmur at apex and base; pulse 72; blood pressure 180/105; liver 4 finger-breadths below the costal margin, edge somewhat tender; spleen not felt. There was slight general abdominal tenderness. The prostate was moderately enlarged. Blood film was normal. The urine showed a specific gravity of 1.025, a slight trace of albumin, 0.3 per cent of sugar and a rare red blood cell in the sediment. An electrocardiogram showed left axis deviation and delayed intraventricular conduction time of a moderate degree.

He was sent by this consultant to Dr. L. B. Morrison for x-rays and the following report was given: "Barium meal passed readily down the esophagus, filling the stomach, which is up in position. The esophagus goes directly into the cardiac end of the stomach close to the diaphragm. Peristalsis was normal. There was a good antrum, sphincter and first portion of the duodenum. The second and third portions of the duodenum swung out around the head of the pancreas; this seemed to be an anatomic rather than a pathologic condition. We can find no ulcer and no malignancy in the stomach. In the afternoon the barium column was going into the cecum, and was well along towards the splenic flexure. The coils of the ileum looked normal. At twenty-four hours there was still considerable barium in the colon. The cecum and ascending portion of the colon were empty. A barium enema given showed numerous diverticula of the sigmoid and descending colon. The whole colon was so spastic that I was unable to get it over to the cecum because of the spasm. One diverticulum in the sigmoid was nearly one-half inch in diameter. The colon emptied rather spasmodically, the circular muscles contracted. The dye was given for the Graham test. We were able to visualize the gall bladder; it concentrated rather poorly but we could get no characteristic shadows of stone. It is not a large gall bladder." The heart showed some enlargement with prominence of the knob. It was suggested by Dr. Morrison that the patient be put on oil for a few days and the colon checked again, but the patient did not report for further examination.

About this time it was noted that the patient was not quite so alert mentally as he formerly had been, that he was apt to drowse in his chair, and that his appearance was not so immaculate as in the past.

Conditions remained essentially the same until December, 1932, when he was in bed for a week with an acute respiratory infection. In February, 1933 he developed nausea with some vomiting in association with what he thought was an acute upper respiratory infection, although there was no definite evidence of disease of this nature. Physical examination was essentially the same as previously reported.

Diabetes was controlled with some difficulty because of the vomiting. There was nothing to suggest that this symptom was of acidotic origin.

On March 23, 1933, he reported that he had never been entirely well since the attack in February. He had been vomiting off and on, usually in the morning, and on one or two occasions after retching a slight amount of blood had appeared in the vomitus. He seemed definitely to have failed. There was no appreciable loss of weight. He had turned against food and was losing strength. The liver edge was palpable, as usual, and in addition there seemed to be an area somewhat more hard and tender in midepigastrium. It might have been liver but felt more like a mass. He was therefore sent to the hospital for further study.

First admission, two months before his final entry. The physical examination was unchanged. The heart rate was 80-90; sounds the same; blood pressure 170/100. Gastric analysis on March 27: No fasting contents were obtained; twenty-five minutes after 50 cubic centimeters of 7 per cent alcohol 40 cubic centimeters was obtained with a free hydrochloric acid of 18 and a total acidity of 22.

He was reëxamined by x-ray at this time by Dr. George W. Holmes, who reported as follows: "The lung fields are large and bright. The diaphragm is rather low but moves normally with respiration. The heart shadow is slightly increased downward and to the left. The outlines of the various chambers are indistinct and the pulsations flabby. The aorta is prominent in the region of the knob, but not dilated. *Gall bladder,* Graham method: The gall bladder was not visible after taking the dye. There were no shadows present suggestive of stones. *Gastro-intestinal tract:* The barium meal passed readily through the esophagus and the stomach filled in the usual manner. There was no deformity of the gastric outline. Peristalsis was rather active. The pyloric sphincter and the first portion of the duodenum appeared normal. The duodenal loop was rather wide; there was no evidence of obstruction. There was also a soft tissue shadow between the fundus of the stomach and the diaphragm. This is probably due to enlargement of the left lobe of the liver; the wide duodenal loop is not unusual in a patient of this build. Six hours after the meal the stomach was empty; the head of the barium column had reached the sigmoid, and in twenty-four hours it had reached the rectum. The colon was examined both by meal and enema. Scattered along its descending portion there were several small bud-like shadows which probably represent diverticula. There was no evidence of obstruction or irregularity of outline. The appendix was seen, apparently completely filled, movable and not tender. The cecum was rather large. It lay in the right iliac fossa. *Genito-urinary:* The kidney outlines were indistinct on both sides. There were no shadows present which could be interpreted as stones. There was an anatomic variation at the sacro-lumbar junction,—a transverse process which was fused with the top of the sacrum. The transverse process immediately above it was unusually small. There were arthritic changes in the spine and along the sacro-iliac joints. There was a dense bony bridge across the symphysis pubis. *Conclusions:* The findings are those of arteriosclerosis, a slightly enlarged flabby heart, enlargement of the liver, diverticula of the colon and a positive Graham test."

After ten days in the hospital, during which time he improved under rest and careful regulation of his diet, the patient was discharged and returned to his home.

History of interval. He showed no specific changes during the course of the next two months, but continued to fail gradually. There were increasing apathy and loss of appetite and strength.

Second admission. On June 4, 1933, he was readmitted to the hospital because of increasing drowsiness with loss of strength for a week and vomiting of blood and passing of blood by rectum during the twenty-four hours just previous to entry. He was quite sick on admission, was unable to retain food and had obviously gone downhill considerably. His weight was 221, a gain of 20 pounds in the previous month.

Physical examination was otherwise unchanged except for the presence of a moderate amount of fluid in the abdomen. There was no marked acidosis. The non-protein nitrogen was normal. A liver function test showed 90 per cent retention of dye.

He was treated with glucose intravenously and two days after admission was again able to take food by mouth. There was no further vomiting and no evidence of bleeding on the stool examinations. Nine days after admission his abdomen was distended with fluid. Abdominal paracentesis was done and 7 liters of fluid removed. Its specific gravity was 1.004, the other findings being consistent with those of a transudate. Following paracentesis he was put on a course of salyrgan, but the abdomen began to fill up very promptly and a second tap was necessary three weeks later. With the fluid removed the liver was palpable about two centimeters below the costal margin, slightly tender and extending about two centimeters further down on deep inspiration. It seemed definitely smaller then it had been a few months earlier. The spleen was not felt. Following the second tap salyrgan was continued and carbohydrates were forced. He showed slight symptomatic improvement. His appetite picked up, there was no nausea, and the daily examination of stools showed no evidence of bleeding. However, despite the use of salyrgan and glucose the abdomen filled again and it was necessary to tap for the third time on July 19.

On the following day he began to complain of mild abdominal pain and developed suppression of urine, voiding only one ounce. Two days later abdominal pain, non-localized, became much more severe and continued. A fourth abdominal paracentesis, a week after the previous one, gave no relief of pain. Meanwhile the urine output remained one or two ounces daily. It had been impossible because of the size of the abdomen to determine the condition of the bladder, so catheterization was done in order to exclude prostatic block. No difficulty was encountered on introducing the catheter, but less than an ounce of urine was obtained. The abdominal pain grew worse, requiring frequent doses of morphia. The non-protein nitrogen was 63. The patient gradually developed coma and died on July 28, eight weeks after his final admission.

Clinical Discussion

Dr. Adams: The diagnosis at his first discharge from the hospital was diabetes, obesity, arteriosclerosis, arteriosclerotic and hypertensive heart disease and possible chronic cholecystitis.

It is interesting to note that during the last month in the hospital the liver definitely decreased in size. At the time of his final admission to the hospital the history of nausea and vomiting with the loss of appetite, the blood and the alcoholic history pointed to a diagnosis of cirrhosis of the liver. The ascites, with the character of the fluid which was removed, seemed to make this certain. We speculated considerably concerning the cause of the sudden suppression of urine. We had pushed salyrgan as hard as we dared, but had watched gums and urine with great care in order to catch the first sign of mercurial poisoning. We felt that we were justified in pushing the drug, as it offered the one hope of relief of the recurring ascites. When his kidneys suddenly shut down, we wondered whether there might have been a relation between this episode and the administration of salyrgan. Samples of the small amount of urine passed showed no evidence of kidney irritation; it was thought that the mercurial probably was not the cause and that the kidney failure was merely a part of general disintegration.

The abdominal pain, severe, non-localized, which occurred during the final days of his illness, was puzzling. The possibility was considered of a low-grade peritonitis resulting from frequent tappings with the leakage which inevitably followed, but seemed unlikely in the absence of nausea, vomiting, increased temperature, spasm or cessation of peristaltic activity. It was decided that this pain was of the type not infrequently seen, but unaccounted for, so far as I knew, in the terminal stages of liver disease. These two problems made the postmortem examination of particular interest.

Worth mentioning again is the fact that the man is known to have had a palpable liver for seven years and that it appeared to shrink rapidly in size during the final month of his life.

The diabetes was an incidental factor so far as termination of life was concerned.

It is also worth pointing out in view of the discussion of the previous case that for a few days six months before admission, and before there was any evidence of ascites, this patient had some edema of the ankles. It cleared up after small doses of digitalis and remained absent until the final weeks of illness, when it recurred with the ascites.

Dr. Walter Bauer: Was there any reason to suspect bronzed diabetes in this man?

Dr. Adams: Before coming here I was told in discussing this case with one or two other physicians that this question would be the first that would be asked. We did not suspect hemochromatosis.

Dr. Bauer: There was no pigmentation?

Dr. Adams: No; and never any jaundice. We believed that there was no connection between the two, although we did not have any skin removed for pathologic examination.

Clinical Diagnoses

Cirrhosis of the liver.
Diabetes mellitus.

Dr. F. Dennette Adams' Diagnoses

Cirrhosis of the liver of the portal type.
Diabetes.
Obesity.
Hypertensive heart disease with hypertrophy.
Arteriosclerosis.

Anatomic Diagnoses

Cirrhosis of the liver, alcoholic type.
Esophageal varices.
Ascites.
Hydrothorax, bilateral.
Arteriosclerosis, coronary and aortic, moderate.
Carcinoid of the jejunum.

Pathologic Discussion

Dr. Tracy B. Mallory: In connection with this man's history, he belonged until 1929 in the millionaire class. It is frequently said that alcoholic cirrhosis is a disease of the poor, who are unable to afford anything but bad liquor. Perhaps the fact that it is much more apt to be seen in the poor than in the rich is due to the fact that there are few millionaires after all.

I will show you the slides of the liver. It is a perfectly typical alcoholic cirrhosis. At the time of autopsy the liver was normal in size and very finely granular. There is an extremely

diffuse cirrhosis. No lobular structure persists at all. There are small masses of liver cells each approximately the size of a liver lobule but without any normal arrangement. The persisting liver cells show very excessive fat vacuoles and with high power it is possible to make out the pathognomonic hyalin reticulum in the cytoplasm of the liver cells. There can be no question whatever that this case belongs in the group of alcoholic cirrhosis.

The other findings were very slight. He had a slightly hypertrophied heart and a moderate degree of arteriosclerosis. Esophageal varices were present. The pancreas was not particularly abnormal, and there was no trace of pigmentation in his liver or elsewhere, so that hemochromatosis can be completely ruled out, although in any case with coexisting diabetes and cirrhosis it should certainly be thought of.

In both this case and the preceding one the question has come up of a superimposed atrophy on top of a preceding cirrhosis. In this man the apparently rapid shrinkage of the liver from what must have been considered hypertrophy down to practically normal size at the time of death would distinctly suggest atrophy, but in neither case is there the slightest histologic evidence of it. The process in each case is the usual slow, uniform degeneration of the individual liver cells scattered throughout the entire liver substance.

DR. ARLIE V. BOCK: Did you think his bleeding came from the varices?

DR. MALLORY: I think in all probability it did. We found no other explanation for it in this case.

DR. CHESTER M. JONES: There is one point I should like to comment on in Dr. Adams' case, that is the abdominal pain. I think it is important to remember that in the terminal stages of cirrhosis very severe abdominal pain is not uncommon. It very frequently resembles a surgical emergency, yet at autopsy nothing is found but cirrhosis. I suppose you have to say here that the pain was due to cirrhosis.

DR. ADAMS: That is the conclusion to which we are forced.

DR. BOCK: There was a case a few years ago on Dr. E. P. Richardson's service diagnosed by all the surgeons as one of gall stones in the common duct. At exploration the gall bladder was normal, but the patient did have a cirrhotic liver and he had had severe abdominal pain.

DR. MALLORY: I have seen several cases explored for gall stones when nothing was found at autopsy but cirrhosis or atrophy.

DR. ADAMS: Was the gall bladder normal? It filled fairly well on two x-ray examinations and not at all on one.

DR. MALLORY: It was absolutely negative.

DR. BOCK: Was the dye given intravenously as well as by mouth?

DR. ADAMS: It was not to my knowledge given except by mouth.

DR. BOCK: The question is often brought up about absorption of the dye from the gastrointestinal tract when liver disease is considered as to differences in the concentration of the dye in the bile depending upon the route of administration whether by oral or intravenous means.

DR. GEORGE W. HOLMES: When the liver is incapable of excreting the dye it makes no difference whether the dye is given intravenously or by mouth.

DR. ADAMS: I should like to ask Dr. Jones whether he can account for the sudden suppression of urine.

DR. JONES: I cannot, except that in the terminal stages we get a picture very similar to that of uremia and there is usually some interference in renal function. I cannot explain it, but I know that it does occur. There may be very marked dehydration even with edema and ascites.

DR. MALLORY: When the liver necrosis is sufficient there is almost complete suppression of urea formation, and that is the most important natural diuretic.

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THE PERIPATETIC NATURE OF MEDICAL SCIENCE

THE nature of all scientific teaching and learning is essentially peripatetic. You will remember the four great schools of Greek philosophy —the Academy, the Porch, the Garden, and the Lyceum. Each has its own validity, each pleases and satisfies and serves us in certain relations of life.

Plato, reclining at ease in the shady and mysterious groves of Academe, communed with his fellows on the nature of God and the soul, on immortality, virtue, and the spiritual truths of existence. His is the mood in which within ourselves we approach religion and the eternal and metaphysical verities of life, considering our own relation with the infinite.

Conversely, it is the stoic philosophy of Zeno in the Porch which teaches and fits us to meet the variegated contacts with men in practical everyday life, to encounter the bitter struggle for existence, to earn a living by the sweat of our brows, to receive and turn aside the "slings and arrows of outrageous fortune," even to endure the sharpness of pain and death and to overcome and rise superior to them by a supreme and divine disdain.

With Epicurus in the sweet seclusion of his Garden we approach kindly communion with the beauties of nature and of life. This is the field of all the arts. It teaches us, not the hedonistic pleasures of the senses, but the significance of the living universe as manifested to us through their channels, and through the emotions which they create. Poetry and music, as the noblest and purest of the arts, are the revelation and interpretation of the meaning of life in all its aspects. In them and in the other kindred fine arts we find much of our deepest and most genuine happiness, solace, and contentment.

In the Lyceum, Aristotle, the great father of all scientific thought, laid the foundations of the scientific method of research. His is the realm of pure intellect. His habit of walking about with his pupils as he taught, which gave the name Peripatetic to his School, is emblematic of the sublime restlessness of the scientific mind, which is impelled by an irresistible and insatiable curiosity to investigate dispassionately the facts of the physical universe in which it finds itself, to test all things, and to hold fast only that which proves true.

Medicine, in common with all the other sciences, has essentially this temper and method. It is never static, but always experimental and progressive. The scientist in his laboratory walks about from desk to desk, examining and teaching, and "goes observing matters till he dies". The clinician proceeds from bed to bed, from patient to patient, and his students with him "walk the hospitals", learning most from his ambulatory comment and conversation. Perhaps the best and richest of all medical teaching and learning is thus accomplished as it were in transit. Thus the scientist roves perpetually the universe, unlocking one by one the secrets of natural law and ameliorating thereby the condition of man in nature.

The great physician must be first of all a great man. If he is to be such, he cannot neglect any of these four great manners of contact, with God, with men, with art, and with science. Only in so far as he weaves into the fibre of his own life and personality these four elemental strands can he attain that completeness which qualifies him for beneficent ministration to others; only in so far can he orient himself with his universe, meet the world on equal and independent footing, obtain that inward happiness from the contemplation of beauty which alone can solace the arduousness of his existence, and pursue his peripatetic progress through the fascinating fields of scientific observation.

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

THE program of the meetings of the American Association for the Advancement of Science appears on page 1251 of this issue. These exercises cover many of the important subjects of medicine, and will provide four days of postgraduate instruction.

Fortunately the Association extends an invitation to all who may be interested to attend the sessions. The list of speakers carries assurance of the high quality of instruction in the subjects selected. A vacation covering these four days will be of profit to physicians; and dentists, nurses, and social workers will be interested in some of the lectures.

There should be large and appreciative audiences of those who wish to have authoritative information.

A PROFFERED PRIVILEGE

A SIGNED letter on stationery with the heading Standard Laboratories, Inc., 30 Huntington Avenue, Boston, Massachusetts addressed to a Fellow of the Massachusetts Medical Society reads as follows:

Dear Dr. ——

If you had a scientific, ethical remedy which successfully coped with arthritis and no other physician in your community knew how to acquire or prescribe this remedy, your prestige and income would doubtless increase immeasurably.

We have such a medicinal product. It is now being used by the profession here in Boston with definitely gratifying results, and we have just launched a plan whereby one physician in each community may acquire exclusive rights to use this product, after satisfying himself entirely at our expense that he wishes to do so.

If you care to be that man in ——, or if you would like to discuss the plan with us, please designate an appointment.

Sincerely yours,

Several interesting questions appear to be in order. First, what is this ethical remedy which can successfully cope with arthritis? Secondly, how many physicians will enter into this form of competition, and thirdly, what will happen if a Fellow of the Massachusetts Medical Society enters into this plan to create a demand for the alleged remedy?

If other members of the Society have received similar letters, that is also of interest.

We are confident that there will not be many physicians who will establish relations with this organization.

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors:

HOLDEN, FREDERICK C. M.D. University and Bellevue Hospital Medical College 1892. F.A.C.S. Professor of Obstetrics and Gynecology, N. Y. University and Bellevue Medical College; Attending Obstetrician and Gynecologist-in-Charge, Bellevue Hospital; Consulting Obstetrician Methodist Episcopal Hospital, Brooklyn and Mt. Vernon Hospital, Mt. Vernon; Attending Gynecologist French Hospital. Consulting Gynecologist, St. Joseph's Hospital, Far Rockaway, New York Nursery and Child's Hospital, Broad St. Hospital, Harlem Hospital, Department of Cancer, New York; Jersey City Hospital, Jersey City. Consulting Gynecologist and Obstetrician, Margaret Hague Maternity Hospital, Jersey City. His subject is "Pelvic Inflammation. Course and Treatment and Elliott Treatment." Page 1191. Address: 59 East 54th Street, New York, N. Y.

KELLOGG, FOSTER S. A.B., M.D. Harvard University Medical School 1910. Instructor in Obstetrics, Harvard Medical School. His subject is "Placenta Previa." Page 1201. Address: 19 Bay State Road, Boston.

ALDEN, CARMI R. M.D. Tufts College Medical School 1919. Assistant Professor of Obstetrics, Tufts College Medical School. Visiting Surgeon for Gynecology and Obstetrics, Boston City Hospital. Instructor in Pharmacology, Tufts College Medical School. Assistant in Gynecology, Harvard Medical School. His subject is "The Use of Pituitary Extract in Obstetrics." Page 1211. Address: 270 Commonwealth Avenue, Boston.

SMART, CHESTER L. M.D. University of Vermont College of Medicine 1915. F.A.C.S. Surgeon, Laconia Hospital. His subject is "Malignancy of the Colon." Page 1216. Address: 634 Main Street, Laconia, N. H.

PROVOST, ADOLPHE J. M.D. Boston University School of Medicine 1924. Aural and Ophthalmic Surgeon, Notre Dame General Hospital, Hillsborough County General Hospital. His subject is "Latest Developments of the Tonsil Problem." Page 1221. Address: 1061 Elm Street, Manchester, N. H.

BEECHER, C. H. M.D. University of Vermont College of Medicine 1900. F.A.C.P. Professor of Medicine, University of Vermont. His subject is "The Management of Congestive Cardiac Failure." Page 1226. Address: 266 Main Street, Burlington, Vermont.

PENNOYER, GRANT P. A.B., A.M., M.D. Harvard University Medical School 1919. F.A.C.S.

Member of the New York Surgical Society. Assistant attending surgeon, Roosevelt Hospital, New York City. Chief Surgical Outpatient Department, Roosevelt Hospital, New York City. His subject is "Varicose Veins and the Injection Treatment." Page 1228. Address: 59 East 54th Street, New York, N. Y.

MACOMBER, DONALD. A.B., M.D. Harvard University Medical School 1909. F.A.C.S. Research Fellow in Obstetrics, Harvard Medical School. His subject is "Studies of Reproduction in the Rat. III. Vitamin E—Neutralized When Mixed with Lard." Page 1235. Address: 321 Dartmouth Street, Boston.

CORRESPONDENCE

THE AMEBIASIS SITUATION

City of Chicago
Board of Health
December 2, 1933.

Dr. W. L. Burrage,
Secretary, Massachusetts Medical Society,
Dear Dr. Burrage,

So that you may be informed as to the present status of the amebiasis situation as it confronts us here in Chicago, I am giving you the following figures for your information:

To date there have been reported 419 cases, involving 138 cities, with a total of 26 deaths. Apparently these cases originated in Chicago. We have also discovered 384 carriers.

May I also list chronologically for you, the various steps in relation to this outbreak and its control:

For some years, approximately two cases of amoebic dysentery have been reported each month to the Board of Health. On August 15, a report of two cases in hospitals in Chicago came to our attention, and investigation revealed that both patients had eaten at one hotel in this city. An immediate examination was made of all food handlers in this hostelry. These examinations, completed by September 1, indicated sixteen persons with active diarrhea whose stools contained Endameba histolytica, and eleven carriers of the organism.

Since available statistics indicate that approximately 5 to 10 per cent of the entire population are infested, this observation did not seem to be reason for serious concern. This was particularly the case since an outbreak in another Chicago hotel in 1927 had apparently been fully controlled by the establishment of certain stringent sanitary precautions. These same precautions that controlled the 1927 outbreak were established in the hotel concerned in the present outbreak and are still in force. In the meantime, the situation was continuously studied.

As further clinical cases were not reported from either the hotel concerned or the city at large, it did not seem necessary at that time to make general announcement. Nevertheless a preliminary report was read before the American Public Health Association meeting in Indianapolis on October 9 and released to the press which, unfortunately, did not apparently consider the item of enough significance to give it widespread circulation.

The incubation period of amoebic dysentery may be as long as 94 days. Therefore, about the middle of October, reports began to come in, indicating the presence of some cases outside of Chicago among persons who had stopped at the hotel concerned during the previous four months. Steps were taken immediately to reëxamine every food handler as well as the non-food handlers. Moreover, questionnaires were sent to all persons who had registered at the hotel during June, July, and August. As these questionnaires were returned, the Board of Health of the City of Chicago used the long distance telephone and telegrams to apprise both physicians and patients of the necessity for a study of every case of diarrhea for possible amebiasis.

By November 5, although only one-fifth of the questionnaires had been returned, enough well authenticated data were at hand to justify us in beginning to assemble them for publication. Full reports were made and published in *The Journal of the American Medical Association*, the information being released simultaneously to newspapers and news periodicals on November 14.

From the first day that we were notified of the existence of a case of amoebic dysentery, and every day thereafter, as soon as a case was reported to us, we immediately notified the State Director of Health at Springfield, Illinois, and he in turn made a report of those cases to the United States Public Health Service by telegraph each Monday. After thoroughly investigating the situation here in Chicago, Dr. Roscoe R. Spencer, of the United States Public Health Service, issued the following statement:

"Everything humanly possible has been done to control the outbreak. There is certainly no need for any general alarm. Dr. Bundesen and the Board of Health are to be congratulated on the promptness, aggressiveness and thoroughness with which the situation has been handled."

I shall appreciate it if you will advise me of any cases with a possible Chicago origin that come to your attention, and I shall keep you informed, from time to time, as to what is occurring.

With kind personal regards, I am

Very truly yours,

HERMAN N. BUNDESEN, M.D.,
President, Board of Health.

RECENT DEATHS

FROTHINGHAM—RICHARD FROTHINGHAM, M.D., a specialist in New York, died December 6, 1933. He was born in Charlestown, the son of Thomas Goddard Frothingham, and Frances (Cook) Frothingham, who were identified with the history of that section.

He was educated at the Charlestown schools, the

Boston Latin School, and graduated from the Harvard Medical School in 1892. He carried on practice in association with his wife, Dr. Florie (Deutsch) Frothingham.

HOLYOKE—Frank Holyoke, M.D., of 187 Walnut Street, Holyoke, Massachusetts, died at his home, December 5, 1933, after a long illness.

He was born in Cambridge, Massachusetts, July 23, 1855, the son of Charles Otis Holyoke and Mary White Gannett Holyoke. His mother was a descendant of Sally White, born on the Mayflower. Dr. Holyoke was a descendant of Elizur Holyoke, the founder of the city. His great-grandfather, Edward A. Holyoke, was the first president of the Massachusetts Medical Society. He was educated in the Cambridge schools, Phillips Exeter Academy, the Harvard Scientific School and graduated from the Harvard Medical School in 1883. He joined the Massachusetts Medical Society in the same year. Before graduating in medicine he spent a year in Vienna. After several years of practice he became the head of the Holyoke Hospital and performed the first surgical operation in that institution. He was also on the staff of the Providence Hospital for several years. In 1899 he was appointed medical examiner followed by a continuous service of twelve years. He was a successful general practitioner and a skillful surgeon, although his major interest was in family practice. He was formerly president of the Holyoke Medical Association, a member of the Springfield Academy of Medicine and the American Medical Association.

He was active in the Connecticut Valley Historical Society, the Connecticut Valley Harvard Club and the Massachusetts Society of Mayflower Descendants. He is survived by his widow, Rena (Mosher) Holyoke; three daughters, Mrs. Margaret Cameron of San Diego, California; Mrs. Elizabeth Decker, Long Beach, California, and Mrs. Judith Mann, Branford, Vermont; one son, Victor Holyoke of New York City, and one brother, Charles Holyoke, of Medford.

WILLEY — Walter Brown Willey, M.D., of 545 Broadway, Everett, Massachusetts, died suddenly, December 7, 1933.

Dr. Willey was born in Bangor, Maine, in 1892 and graduated from Tufts College Medical School in 1917, and had practiced in Everett since that time. He served at one time as city physician and was a lieutenant in the medical corps during the World War.

He is survived by his widow, Gladys F. Willey, and his father, Walter B. Willey.

NOTICES

REMOVALS

P. Canzanelli, M.D., wishes to announce the removal of his office from 558 Mount Auburn Street, to 12 Palfrey Street, Watertown.

John R. Barry, M.D., announces the opening of an office at 1857 Centre Street, West Roxbury.

CLINIC AT THE PETER BENT BRIGHAM HOSPITAL

On Thursday, December 21, in the amphitheatre of the Peter Bent Brigham Hospital at 3:30 P.M. there will be a clinic conducted by Dr. Henry A. Christian, Hersey Professor of the Theory and Practice of Physic in the Harvard Medical School, to which physicians are cordially invited.

RADIO HEALTH MESSAGES

December, 1933

Health Messages

Sponsorship: Public Education Committee of the Massachusetts Medical Society and Massachusetts Department of Public Health.

Courtesy WBZ. Fridays, 4:30 P.M.

Dec.
15 The Preschool Child
22 Cancer of the Intestinal Tract
29 Preventive Medicine from Your Family Physician

State House Broadcast

Sponsored by the Massachusetts Department of Public Health.

Courtesy WEEI. Fridays, 1:15 P.M.

Health Subjects of Public Interest discussed by the Division Directors of the Department.

Radio Health Forum

Queries from the public are answered under the sponsorship of the Department of Public Health.

Courtesy WEEI. Fridays, 5:00 P.M.

Questions on Health and Prevention of Disease may be sent to Radio Health Forum, State Department of Public Health, State House, Boston.

REPORTS AND NOTICES OF MEETINGS

THE WILLIAM HARVEY SOCIETY

The William Harvey Society of Tufts College Medical School held its November meeting in the amphitheatre of the Beth Israel Hospital on Friday evening, November 10, at 8:15 P.M. Dr. Henry D. Chadwick, Commissioner of Public Health in Massachusetts, and chairman of the meeting, introduced the topic of the evening by outlining the State's activities in the control of cancer. During the past year, 3500 patients have been seen in the various clinics throughout the State. The work done at the Pondville State Hospital which has a capacity of 115 beds was described. A recent appropriation from the Federal Fund is permitting further construction and will provide the hospital with 25 more beds.

The principal speaker of the evening was Dr. J. C. Bloodgood, Clinical Professor of Surgery at the Johns Hopkins University Medical School. He had been scheduled to talk on "Irradiation in the Treatment of Cancer," but he chose instead to discuss some aspects of breast tumors because of the importance of the subject and because of his recently developed ideas in this field. The first group of tumors he mentioned was that of the "comedo adenocarcinomata". The microscopic and clinical appearance of these tumors is definitely malignant. They often fungate and may involve the entire breast as is the case in Schimmelbusch disease. There is never any glandular involvement, however, and patients never die of the disease. The growth, then, is that of a benign tumor. It is the only type of carcinoma in which recurrence is cured by surgery. One of the cases cited had been operated upon by Dr. Finney in 1893 and lived 19 years to die of some other disease. The photograph of a case with a very large fungating tumor of the breast was shown. The picture had been taken by Dr. Harvey Cushing when he was in Baltimore. The patient proved to have a comedo adenocarcinoma. She died several years later, however, of an inoperable carcinoma of the cervix.

There are two extremes in breast tumors: the comedo adenocarcinoma and the highly malignant "acute carcinoma". The former is a relatively benign lesion and is cured by conservative surgery. The latter is incurable, and operation merely increases the patient's discomfort. Irradiation is to be advised in these cases instead of surgery. A case was cited in which there was intermittent retraction of the nipple with corresponding variation in size of the tumor. At operation a comedo adenocarcinoma was found.

In a second group of cases, Dr. Bloodgood discussed chronic cystic mastitis and blue dome cysts. His personal opinion is that cystic disease of the breast is not a precancerous lesion. He cited one case with lesions bilaterally in which a simple mastectomy was done on only one side. Some years later the cysts in the intact breast disappeared spontaneously. He emphasized the fact that it is especially in these cases that competent pathologists disagree regarding the benign or malignant nature of the condition. He has sent sections of the tissue around blue dome cysts to pathologists throughout the country and there is no general agreement as to the nature of the process. Dr. Bloodgood made the point that whenever good pathologists disagree, the patient in question never dies of cancer.

The importance of transillumination in the diagnosis of tumors of the breast was emphasized. If the mass is as large as a twenty-five cent piece and transilluminates, it is a cyst. For smaller tumors the procedure is not dependable.

In conclusion, Dr. Bloodgood made some interesting observations on irradiation in the treatment of malignancy. He believes it wise to irradiate any suspicious area before operation or even before biopsy. Some of the tumors disappear after irradiation even before biopsy is done.

The discussion was opened by Dr. Robert B. Greenough of Boston. He disagreed with Dr. Bloodgood's idea on chronic cystic mastitis. Some thirty years ago he and Dr. Hartwell analyzed 30 cases of chronic cystic mastitis at the Massachusetts General Hospital. In 24 of the 30 cases, in addition to fibrosis and dilatation of the ducts, there was a transformation of the epithelium of the ducts to a high columnar type; in 13 cases this epithelium was thrown into folds from overcrowding on the basement membrane; in seven cases the proliferating epithelium had almost completely filled the ducts; and in three of the 30 cases there was actual cancer. In these last three cases cystic disease coëxisted and in no case was there cancer without definite epithelial proliferation elsewhere in the breast. The process of epithelial proliferation followed by desquamation (to which Cheatle applies the term mazoplasia) is to some extent physiological. There is, however, no sharp dividing line between the normal and the abnormal changes. Dr. Greenough believes that every case of chronic cystic mastitis should be considered as a possible precancerous condition and should be treated accordingly. It is safer to regard the questionable tissue surrounding blue dome cysts in a similar light. In the case of a young woman with mild cystic disease of the breast, the surgeon may not want to operate. The patient, however, should at least be watched very carefully.

The discussion was continued by Dr. Channing C. Simmons who agreed with Dr. Greenough on the relation of chronic cystic mastitis to cancer. He showed a very convincing series of slides illustrating the various stages from Schimmelbusch disease to actual malignancy. He emphasized the fact that chronic cystic mastitis is a disease affecting the entire breast. The palpable cysts are merely local manifestations of the more general disease process. The disease is often said to affect the upper outer quadrant of the breast, but this is where most of the breast tissue is located anyway. The treatment is surgical. He presented statistics showing that treatment of the condition by only partial excision is too frequently unsuccessful. In five per cent of cases so treated, carcinoma later developed in the breast. He stressed the importance of biopsy in all cases of breast tumor and pointed out that operation must follow immediately upon receiving the pathologist's report from frozen section. Operation a week or so after biopsy has proved of no avail.

The discussion was closed by Dr. Bloodgood who expressed his approval of differences of opinion, especially since they stimulate men toward the quest of further knowledge. He agreed that the attitude of Drs. Greenough and Simmons toward chronic cystic mastitis is the safer course to adopt especially in cases of doubt. Differences of opinion,

however, arise only in the handling of borderline cases. He advocated the training of pathologists so that they may attain a high degree of skill in the diagnosis of malignancy, at least until a differential stain for the cancer cell is developed.

NEW ENGLAND OBSTETRICAL AND GYNECOLOGICAL SOCIETY

On Wednesday, November 22, 1933, the Fifth Annual Meeting of the New England Obstetrical and Gynecological Society was held at Boston, Mass., with headquarters at the University Club.

In the morning clinics were held at the Free Hospital for Women and the Boston City Hospital, following which a buffet luncheon was served at the University Club. In the afternoon, clinics were held at the Boston Lying-In Hospital and the Carney Hospital.

The annual dinner was held as usual at the University Club, and the speaker of the evening was Mr. Fred. Wallace, well-known submarine diver, who gave an interesting account of his experiences.

Dr. Edward S. Brackett of Providence, R. I., the retiring President, read a thorough and interesting paper discussing Maternal Mortality.

The officers elected for the ensuing year are as follows:

Dr. Alonzo K. Paine, President.
Dr. Adam P. Leighton, Jr., Vice-President.
Dr. Louis E. Phaneuf, Secretary.
Dr. James R. Miller, Treasurer.
Dr. Frederick J. Lynch, Recorder.
Dr. Frank A. Pemberton, Chairman, Executive Committee.
Dr. Delbert L. Jackson, Chairman, Board of Governors.

F. J. LYNCH, M.D., *Recorder.*

NEW ENGLAND PHYSICAL THERAPY SOCIETY

A meeting of the New England Physical Therapy Society was held on November 15 at the Hotel Victoria in Boston.

Dr. William H. Robey, President of the Massachusetts Medical Society, was the speaker of the evening. His subject was "Normal and Abnormal Conduction Waves of the Heart." He first showed Dr. Lundy's film which is a diagrammatic presentation of the origin and transmission of the conduction waves of the heart studied in normal conditions. The film shows the origin of the contraction impulses in the sinoauricular node, their spreading over the auricular walls, their transmission through the conducting tissues and their course through the ventricles. Simultaneously the production of the curves which are obtained by photographing the oscillations of the string in the galvanometer on a moving picture film was shown. Slides were then thrown on the screen of electrocardiographic curves photographed from the patients to show abnormal movements of the galvanometer in pathological heart conditions. Twenty abnormalities were shown as follows: sinoauricular tachycardia; high and broad P-wave; auricular premature beating arising in or near SA node; auricular premature beat arising in or distant from SA; auricular paroxysmal tachycardia; auricular flutter; auricular fibrillation; AV Block prolonged P-R only; AV Block prolonged P-R and dropped beat; AV Block prolonged complete block; AV Block prolonged 2-1 block; notching QRS in 1 Lead low amplitude; very low amplitude; left bundle branch block; right bundle branch block; ventricular premature beats; ventricular premature beats from varying foci; bigeminal rhythm; T-wave digitalis type; T-wave coronary; with one case of sinus arhythmia.

Dr. George Levene discussed the relative merits of electrocardiography and roentgenologic study in the diagnosis of heart conditions. He stated that the electrocardiograph records the production and distribution of electrical impulses within the heart which are known to occur during different phases of the heart's physical activity.

Since the electrocardiograph does not measure the dynamics of the heart, the identification of valvular disease and a knowledge of the functional integrity of the heart call for additional diagnostic procedures, such as physical examination and roentgenologic study.

The electrocardiograph is chiefly of value in studying the arhythmias and gives important information in suspected coronary disease; x-ray examination is more useful in confirming the presence of valvular and pericardial involvement.

While the findings on an electrocardiogram are generally in accord with those obtained by roentgenological examination, they frequently must be regarded as suggestive, rather than indicative, of certain cardiopathies. Thus, while an exaggeration of the P-wave suggests auricular enlargement, it does not justify a diagnosis of mitral stenosis. Likewise, inversion of the T-waves may be due to ventricular strain attending valvular disease rather than to coronary sclerosis. The most complete study of the heart, therefore, necessarily requires that careful physical examination be supplemented by electrocardiography and roentgenological examination.

The papers were discussed by Dr. William D. Reid. He emphasized that the electrocardiogram forms but part of a cardiac examination. The application of its findings to the individual case is important and a reason why the physician has not been replaced by the technician.

The electrocardiogram is especially helpful in the diagnosis of obscure arhythmia, and in the detection of A-V and bundle branch block, and of impairment of the myocardium. Its use is more likely to be of value in cases in which cardiac disease is not obvious, in patients of forty years or more in age. It contributes little to the diagnosis of lesions of the cardiac valves.

Some histories were cited. However one rates the value of the electrocardiogram, it should not be forgotten that to it we owe much of our present ability to diagnose correctly, by clinical examination, the average case of abnormal cardiac rhythm and successfully to prescribe its treatment.

BETH ISRAEL HOSPITAL HOUSE OFFICERS ALUMNI ASSOCIATION

The first annual meeting will take place on Monday, December 18, 1933, at Vanderbilt Dining Halls, Harvard Medical School, Longwood Avenue, Boston.

RUTH WEISSMAN, M.D., *Secretary.*

NEW ENGLAND ROENTGEN RAY SOCIETY

The December meeting of the New England Roentgen Ray Society will be held at the Peter Bent Brigham Hospital, December 16, 1933, at 8:15 P.M.

The program is as follows:

1.) Presentation of Cases—Dr. Hamilton, Dr. Bryan.
2.) Roentgenology in the Diagnosis of Pituitary Tumors—M. C. Sosman, M.D.
3.) Roentgen Therapy in Pituitary Tumors—Richard U. Light, M.D., New Haven, Conn.
4.) Further Observations on Intracardiac Calcification—Paul H. Wosika, M.D.

Dinner at the Harvard Club at 6:30 P.M.

T. R. HEALY, M.D., *Secretary.*

NEW ENGLAND HEART ASSOCIATION

The third meeting of the New England Heart Association will be held in the Thorndike Amphitheatre of the Boston City Hospital, Monday, December 18, at 8:15 P.M.

All members of the New England Heart Association and interested physicians are invited to attend.

PAUL W. EMERSON, M.D., *Secretary.*

NEW ENGLAND HOSPITAL FOR WOMEN AND CHILDREN

The regular clinico-pathological conference of the New England Hospital for Women and Children will be held at the hospital, Dimock Street, Roxbury, at 8 P.M. on Thursday, December 21. The following cases will be presented: Inversion of the Uterus; Prematurity with Congenital Malformation of the Bile Duct; Adenocarcinoma of the Intestinal Tract; Acute Hemorrhagic Pancreatitis.

ALICE H. BIGELOW, M.D., *Secretary.*

BOSTON MEDICAL HISTORY CLUB

SPRAGUE HALL, 8 THE FENWAY

Monday, December 18, 1933, at 8:15 P.M.

"Poem of Dr. Oliver Wendell Holmes." Dr. Garry de N. Hough, Jr.

"Medical History of Contraception." Prof. Norman E. Himes, Colgate University.

Exhibition by the Library of 13th-15th century manuscripts and printed books illustrating the development of the medical book.

JAMES F. BALLARD, *Secretary.*

NEW ENGLAND PHYSICAL THERAPY SOCIETY

A meeting of the New England Physical Therapy Society will be held on December 20 at 8 P.M. in the Banquet Hall of the Hotel Victoria, Boston. The program is in charge of Dr. George B. Carr.

PROGRAM

Baghdad, Babylon and Angkor as Seen by a Medical Man (Illustrated with lantern slides). George B. Carr, M.D., Lynn, Massachusetts.

Dr. Carr has many interesting things to tell of his travels and will show about 140 views made by him. Members of the Society are requested to invite friends. This meeting is designed to be the social evening of the year.

There will be a Council Meeting at six o'clock preceding the Round Table Dinner. Come and bring your guests to dinner.

Physicians interested are cordially invited to attend.

ARTHUR H. RING, M.D., *Secretary.*

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

SECTION N (MEDICAL)

Chairman, C. R. Stockard, M.D., Cornell University Medical College, New York City.
Secretary, Walter M. Simpson, M.D., Dayton, Ohio.

DECEMBER 27 TO 30, 1933

WEDNESDAY MORNING SESSION, DECEMBER 27, 10:30 A.M.

John Ware Hall, Boston Medical Library, 8 The Fenway

1. Chairman's Address: (30 min.) C. R. Stockard, M.D., Cornell University Medical College, New York, N. Y.
2. "Tissue Reactions in Immunity" — (30 min.) R. L. Kahn, University of Michigan, Ann Arbor, Michigan.
3. "Why the Increasing Mortality in Appendicitis" —(30 min.) Irving J. Walker, M.D., City Hospital, Boston.
4. "Results of an Appendicitis Campaign"—(30 min.) Herbert L. Lombard, M.D., Massachusetts Department of Public Health, Boston.

WEDNESDAY AFTERNOON SESSION, DECEMBER 27, 2:30 P.M.

John Ware Hall, Boston Medical Library, 8 The Fenway

Symposium on Pneumonia

1. "Pneumococcus Antibodies, What Are They?"—(30 min.) Lloyd D. Felton, M.D., Harvard Medical School, Boston.

2. "Viability of Bacteria in Air"—(30 min.) W. F. Wells, Harvard School of Public Health, Boston.
3. "Recent Studies in the Epidemiology of Pneumonia"—(30 min.) Wilson G. Smillie, M.D., Harvard School of Public Health, Boston.
4. "Serum Treatment in Pneumonia" — (30 min.) Frederick T. Lord, M.D., Massachusetts General Hospital, Boston.

THURSDAY MORNING SESSION, DECEMBER 28, 10:30 A.M.

John Ware Hall, Boston Medical Library, 8 The Fenway

Symposium on Sociology and Medicine

1. "Medicine in Relation to Social Trends" — (30 min.) Speaker to be announced.
2. "Some Economic Aspects of Medicine"—(30 min.) Douglass V. Brown, Harvard Medical School, Boston.
3. "Teaching the Social Implications of Sickness to Medical Students"—(30 min.) Ida M. Cannon, Massachusetts General Hospital, Boston.
4. "Social Medical Practice"—(30 min.) George R. Minot, M.D., Boston City Hospital.

THURSDAY AFTERNOON SESSION, DECEMBER 28, 2:30 P.M.

John Ware Hall, Boston Medical Library, 8 The Fenway

Symposium on Tuberculosis

1. "Biology of the Tubercle Bacillus" — (30 min.) William Charles White, M.D., National Tuberculosis Association, Washington, D. C.
2. "The Incidence of Tuberculosis" — (30 min.) Henry D. Chadwick, M.D., Massachusetts Department of Public Health, Boston, Massachusetts.
3. "Surgery in Tuberculosis" — (30 min.) E. D. Churchill, M.D., Massachusetts General Hospital, Boston, Massachusetts.

FRIDAY, DECEMBER 29, 1933

John Ware Hall, Boston Medical Library, 8 The Fenway

Morning Session — 9 A.M. — Joint Session of the American Pharmaceutical Association with the American College of Dentists. Theodore Bradley, Dean, Massachusetts College of Pharmacy, presiding.

1. An Investigation of the Viburnums and Their Medical Aspects. Dr. Heber W. Youngken, Massachusetts College of Pharmacy.
2. Certain Scientific Aspects of Pharmacopoeia Making. Dr. E. Fullerton Cook, Chairman of the Committee of Revision of the U. S. Pharmacopoeia.
3. Bioassays in the Control of Medicinal Products. Dr. J. C. Munch, Pharmacologist for Sharp and Dohme.

Afternoon Session—2 P.M. — Joint Meeting of the American College of Dentists with Section N.

1. The Relation of Vascular Degeneration to the Dental Problem. Dr. James C. Healy, Instructor in Clinical Medicine, Tufts College Dental School.
2. The Rat Incisor as an Index of Calcium Metabolism. Dr. Isaac Schour, University of Illinois, College of Dentistry.
3. Back to John Hunter—A Modern Application of Madder Feeding to the Study of Living Bone. A report of the preliminary researches pursued in conjunction with Dr. George B. Wislocki, Parkman Professor of Anatomy, and Dr. Reid Hunt, Professor of Pharmacology of the Harvard Medical School, assisted by Mr. Henry George. Dr. Lawrence W. Baker, Professor of Orthodontia, Harvard University Dental School.
4. Cytological Studies of the Teeth by Use of Vital Staining. Dr. Lester S. King.
5. Palinaesthesia: A Preliminary Report on the Effects of Recall Acid as a Means of Recovery and Restoration to Sensibility. Walter G. MacGilvra, D.D.S., Harvard University Dental School.
6. Studies on the Neural Mechanism of Chewing. Janet M. Rioch, M.D., Research Fellow in Dentistry, Harvard University, 1933.
7. The Necessity for More Acute Observations of Oral Lesions. William J. Macdonald, M.D.

Evening Session — 6 P.M. (Preceded by a dinner. Hotel to be announced later.)

1. The Microörganisms of the Materia Alba of the Teeth (organisms of Tooth Slime). Dr. Theodore Beust, University of Louisville, School of Dentistry.
2. Effects of Short Electric Waves upon Streptococci from Infected Teeth. E. Alfred Wolf, Ph.D., University of Pittsburgh, School of Dentistry.
3. Histopathological Changes in Pulp and Dentine under Different Filling Materials. Russell A. Dixon, Acting Dean, Howard University School of Dentistry.
4. The Etiology, Symptomatology, Pathology and Treatment in Periodontal Disease. Dr. Frederic James, Temple University Dental School.
5. Development of the Mandible. Dr. George P. Matthews, Director of Research, Harvard University Dental School.
6. Application of Physical Methods to the Study of Dental Problems. Dr. Moses J. Eisenberg.
7. Calcium Studies. Milan A. Logan, Ph.D., Instructor in Biological Chemistry, Harvard Medical School.

SATURDAY, DECEMBER, 30, 1933

John Ware Hall, Boston Medical Library, 8 The Fenway

Joint Session — 10:00 A.M. American Society of Parasitologists with Section N.

Twelve to Fifteen Minute Papers

Hans Zinsser, Department of Bacteriology, Harvard Medical School. (Title open.)

Henry Pinkerton, Department of Pathology, Harvard Medical School. "Rickettsiae in Tissue Cultures."

S. B. Wolbach, Department of Pathology, Harvard Medical School. "Pathological Aspects of Various Diseases of the Typhus Group."

Marshall Hertig, Department of Comparative Pathology, Harvard Medical School. "Studies on Rickettsiae-like Microörganisms in Insects."

R. R. Parker, Officer-in-charge of the Rocky Mountain Spotted Fever Laboratory, Treasury Department, U. S. Public Health Service. "Regional Variation in the Virulence of Rocky Mountain Fever and Reservoirs of Infection."

SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

December 15—New England Pediatric Society at the Boston City Hospital, 3:00 P.M. and 8:15 P.M.

December 15 and 16—The American Board of Dermatology and Syphilology will hold oral examinations in New York City. Information may be obtained from the Secretary, Dr. C. Guy Lane, 416 Marlborough Street, Boston, Mass. See page 1184, issue of December 7.

December 16—New England Roentgen Ray Society. See page 1251.

January 15, 1934—Boston Medical History Club. Professor Henry E. Sigerist, Director of the Institute of Medical History of Johns Hopkins University.

JAMES F. BALLARD, Secretary.

Boston Medical Library, 8 The Fenway, Boston.

December 18—New England Heart Association. See page 1251.

December 18—Beth Israel Hospital House Officers' Alumni Association. See page 1251.

December 18—Boston Medical History Club. See page 1251.

December 19—South End Medical Club will meet at 554 Columbus Avenue, Boston, at 12 noon.

December 20—New England Physical Therapy Society. See page 1251.

December 21—Clinic at the Peter Bent Brigham Hospital. See page 1248.

December 21—New England Hospital for Women and Children. See page 1251.

December 27-30—American Association for the Advancement of Science, Section N (Medical). See page 1251.

February 16 and 17, 1934—The New England Hospital Association is holding its Twelfth Annual Meeting at the University Club, Boston. For details write Dr. A. G. Engelbach, Massachusetts General Hospital, Boston.

April 16-20, 1934—The American College of Physicians will hold its Eighteenth Annual Clinical Session in Chicago at the Palmer House. For information write Mr. E. R. Loveland, Executive Secretary, 133-135 South 36th Street, Philadelphia, Pa.

July 24-31, 1934—The IVth International Congress of Radiology will be held in Zurich under the presidency of Professor H. R. Schniz. General Secretary Dr. H. E. Walther, Gloriastrasse 14, Zurich.

September 4, 5, 6, 1934—International Union Against Tuberculosis will be held in Warsaw. For particulars address The National Tuberculosis Association, 450 Seventh Avenue, New York, N. Y.

DISTRICT MEDICAL SOCIETIES

ESSEX SOUTH DISTRICT MEDICAL SOCIETY

Wednesday, January 3—Danvers State Hospital. Clinic 5 P.M. Dinner 7 P.M. Speaker: Dr. Clarence A. Bonner, Superintendent of Danvers State Hospital. Subject: Recent Experiences in Foreign Clinics.

February 7—Council Meeting, Boston.

Wednesday, March 7—Lynn Hospital. Clinic 5 P.M. Dinner 7 P.M. Speaker: Dr. Frank H. Lahey, Boston. Subject to be announced. Film Electrocardiogram.

Wednesday, April 4—Essex Sanatorium, Middleton. Clinic 5 P.M. Dinner 7 P.M. Speakers: Dr. Elliott P. Joslin and Dr. Howard F. Root, Boston. Subject: "Tuberculosis Complicating Diabetes."

Thursday, May 3—Censors' Meeting, at Salem Hospital, 3:30 P.M.

Tuesday, May 8—Annual Meeting. Salem Country Club, Forrest Street, Peabody. Dinner at 7. Speaker to be announced. Subject to be announced.

RALPH E. STONE, M.D., Secretary.

221 Cabot Street, Beverly, Mass.

FRANKLIN DISTRICT MEDICAL SOCIETY

Meetings will be held on the second Tuesday of January, March and May at the Weldon Hotel, Greenfield, at 11 A.M.

CHARLES MOLINE, M.D., Secretary.

Sunderland, Mass.

MIDDLESEX EAST DISTRICT MEDICAL SOCIETY

Meetings will take place on January 10 at Melrose, March (2nd Wednesday) at Wakefield, and May (2nd Wednesday) at Winchester.

ALLAN R. CUNNINGHAM, M.D., Secretary.

76 Church Street, Winchester, Mass.

MIDDLESEX NORTH DISTRICT MEDICAL SOCIETY

Meetings will be held on January 31, and April 25 (Annual Meeting).

T. A. STAMAS, M.D., Secretary.

226 Central Street, Lowell, Mass.

NORFOLK DISTRICT MEDICAL SOCIETY

Postgraduate Course. See page 1184, issue of December 7.

January 28—Tentatively Roxbury Masonic Temple, 8 P.M. Continuance of Symposium on Diseases of the Blood. Dr. Dameshek and Dr. Straus.

February 27—Place, time, subject, and speaker to be announced.

March 27—Place and time to be announced. Dr. Edward A. Edwards and Dr. Henry H. Faxon. Symposium on the Treatment of Varicose Veins.

May—Annual Meeting. Place, time and program to be announced.

FRANK S. CRUICKSHANK, M.D., Secretary.

1695 Beacon Street, Brookline, Mass.

NORFOLK SOUTH DISTRICT MEDICAL SOCIETY

January 4—12 noon at Norfolk County Hospital. Speaker to be announced.

February 1—12 noon at Norfolk County Hospital. Stated Meeting. Speaker: Dr. Sara Jordan. Subject: Stomach Ulcers.

March 1—12 noon at Quincy City Hospital. Program by the hospital staff.

April 5—12 noon at Norfolk County Hospital. Speaker Dr. Elliott P. Joslin. Subject: Diabetes.

May 3—12 noon at Norfolk County Hospital. Annual Meeting. Election of Officers.

N. R. PILLSBURY, M.D., Secretary.

Norfolk County Hospital, South Braintree, Mass.

SUFFOLK DISTRICT MEDICAL SOCIETY

January 31—General Meeting in association with the Boston Medical Library and the Trudeau Society. Speaker: Dr. Lawrason Brown of Saranac Lake.

March 28—Clinical Meeting at the Massachusetts Memorial Hospitals.

April 25—Annual Meeting at the Boston Medical Library. Election of Officers. Scientific Program, titles and speakers to be announced.

The Medical Profession is cordially invited to attend all of these meetings.

JAMES H. MEANS, M.D., Vice-President.
GEORGE P. REYNOLDS, M.D., Secretary,
311 Beacon Street, Boston, Mass.
ALEXANDER S. BEGG, M.D.,
Boston Medical Library.

WORCESTER DISTRICT MEDICAL SOCIETY

All meetings to be held on Wednesdays as follows:

January 10—Dinner and scientific program at the Worcester City Hospital, Worcester, Mass.

February 14—Dinner and scientific program at the Worcester State Hospital, Worcester, Mass.

March 14—Dinner and scientific program at the Memorial Hospital, Worcester, Mass.

April 11—Open date.

May 9—Annual Meeting. Time and place to be announced later.

ERWIN C. MILLER, M.D., Secretary.
27 Elm Street, Worcester, Mass.

BOOK REVIEWS

Report to the United States Government on Tuberculosis with Some Therapeutic and Prophylactic Suggestions. By S. ADOLPHUS KNOPF, M.D. Published by the National Tuberculosis Association. Price $1.15.

This monograph of some 50 pages consists partly of a report concerning certain phases of the tuberculosis campaign as taken by the International Congress against tuberculosis held at The Hague in September, 1932. Its chief value consists in the photographs of well-known tuberculosis resorts with the activities carried therein.

Somewhat unfortunately, Dr. Knopf has used this book as a means of presenting certain agents which he sincerely believes to be of value in tuberculosis but which certainly do not belong in a report of an International Congress, as, for instance, his method of reducing the respiratory rate by controlled diaphragmatic breathing, photographs illustrating the window tent which he devised, along with a chapter giving what are nothing more or less than various testimonials from prominent men who are favorably inclined toward his ideas. The window tent and similar devices play practically no part in the treatment of tuberculosis. Experience has taught us that a room in which the window is kept open gives more fresh air than a window tent. Dr. Knopf's ideas concerning controlled diaphragmatic breathing have not been accepted by the medical profession at large, nor have his ideas concerning teaching children breathing exercises met with any favorable response.

The book is well printed and gotten out and is of interest chiefly for the photographs of Papworth, Preston Hall and other well-known resorts.

The Twelfth (1933) Revised Edition of Stedman's Medical Dictionary. Published by William Wood and Company. Baltimore. 1256 Pages. Price $7.00 for plain edge, or $7.50 for thumb indexed.

Stedman's latest edition shows that medical literature is growing more complex, because writers are contributing many new titles and subtitles to what the editor designates as "medical jargon". This edition is designed to enable physicians and medical students to keep informed of the meaning and correct orthography of the multitude of terms employed by authors. It is painfully apparent to editors of medical journals that many who submit articles for publication, should provide their secretaries with standard medical dictionaries. This latest publication by Wood and Company is well printed, and illustrated, and is a valuable addition to a doctor's library.

A Text-Book of Physiology. By WILLIAM H. HOWELL. Twelfth Edition. Published by W. B. Saunders Company, 1933. Price $7.00.

Howell's textbook which was first printed in 1905 has now appeared in its twelfth edition. Its long popularity is an impressive indication of its merit. Because of the comprehensiveness of the new material added and the frequent references to review articles, this will continue to be a standard reference book on physiology. The reviewer was especially impressed with the excellent discussion of recent literature on vitamins and the chemistry of muscle contraction. It is a pity that the author did not discard some of the older material in order to allow space for a fuller discussion of such subjects as postural and righting reflexes, internal respiration and hormones.

Lectures on the History of Medicine. A Series of Lectures at the Mayo Foundation and the Universities of Minnesota, Wisconsin, Iowa, Northwestern, and the Des Moines Academy of Medicine, 1926-1932. Philadelphia and London: W. B. Saunders Company, 1933. 516 Pages. Price $5.00.

In 1926 the Mayo Foundation of Rochester, Minnesota, in conjunction with the Medical School of the University of Minnesota and one or two other neighboring schools inaugurated a series of lectures on the history of medicine. These have been given from time to time by well-known physicians who have long been interested in the subject, and now this series, some of which have previously been published in medical journals, are brought together in convenient form under the direction of Dr. Louis B. Wilson of Rochester. The subjects covered are widely scattered throughout the history of medicine and do not form any connected story which can be read as a survey of medicine of the past. The most significant of the lectures are those by Dr. Fielding H. Garrison on "Billings: A Maker of American Medicine," "Contributions of the West to American Medicine" and "Medicine as an Agency in the Advancement of Science, Art, and Civilization." Of importance, too, are Dr. John M. Armstrong's "The First American Medical Journals," George W. Corner's "The Rise of Medicine at Salerno in the Twelfth Century" and Dr. Henry Sewall on "The Physiology of Respiration." The work is well published although the illustrations are often not well produced. In general, the book should find a useful place in the library of any student of medical history.